Scarecrow
Dominant Wasp

Posts: 430

FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **on:** October 16, 2014, 05:39:30 PM »

"FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES" which can be found attached. This patent describes a one pot synthesis from Aldehyde to Amide, something that may be useful for people here on this forum. This was recently attempted by a friend who would like the advice of some more experienced bees.

Aldehyde (10g 0.05mol)
Hydroxylamine (3.137g .095 mol) in 100ml of DMSO
Potassium Hydroxide (7.8g in 30ml)
Hydrogen Peroxide (70ml)

Aldehyde (0.05mol, 10g) was added to a solution of Hydroxylamine hydrochloride (.045mol, 3.3137g) [I thought initially 3.3137g would be a 2x molar excess but I was using the mass number for Hydroxylamine not the HCl salt, but when I use a 2x molar excess (7g) it gives a gunky yellow oil at the end that wont precipitate into amide.] in DMSO (100ml). The resulting solution was heated for 60 minutes at 100* over boiling water with vigorous stirring. (Note: Colour changed from clearish to rich light yellow, with smell of seaweed). Upon removal of heat, 30ml of 25% Potassium Hydroxide solution was slowly added over 2 minutes. This changed the colour from light yellow to a dark red/brown. The solution was then put in an ice bath, and hydrogen peroxide (75ml 30%soln) was slowly added with stirring. (The patent calls for the hydrogen peroxide to be added whilst the reaction is still hot, my friend tried this on his first attempt and the RBF took off like a "soyuz rocket" tehe so decided to use an ice bath during the addition of the hydrogen peroxide this time, he assumes the selective hydrolization of the nitrile is quite exothermic...). After the exothermic addition was complete, the solution was extracted with 200ml of ether in a sep funnel. The water layer was thick with some unidentified precipitate, so both layers were vacuum filtered, yielding 40g of which upon recrystalization formed unknown long needle like crystals which can be seen in picture 1. The ether extract was then dried with MgSO4, and distilled to near dryness which left a yellow liquid which can be seen in picture

2. This was then left to evaporate, yielding dirty yellow crystals which can be seen in picture 3. To this was added cold IPA, in which the (amide?) was insoluble, so the IPA/amide solution was heated to boiling until full dissolution. Upon cooling no crystals formed, so the IPA was left to evaporate which left the crystals which can be seen in picture 4, which are still slightly dirty. Needle like crystals have formed.

These crystals weighed in at 6g, not too bad considering my friend only did 1 ether extract because he was in a rush and there were a few unknowns he was toying with. Not sure if this is amide or not, it weighs in approximately the right amount and seems to be consistent with the patent. My friend thinks he may be able to increase yield by using more excess of hydroxylamine to drive aldoxime formation. * UPDATE * This was ran twice increasing the amount of Hydroxylamine HCl to 7g and it ruined the reaction. The thing thats funny is, I tried to use a 2x molar excess of Hydroxylamine but wasnt using the mass number for the HCl, so it turns out I used a 1:1 mole ratio which worked well. When I try using a 2x hydroxylamine excess it completely ruins the reaction giving a yellow goo. Everything runs the same except after extraction the solvent is concentrated and evaporated to yield a funny smelling oil different to Aldehyde and similar to the Amide

Any advice from other bees? These crystals need to be purified more, perhaps an acetone wash, and/or recrystallization in Toluene? My friend will do an m.p test when he gets the chance..

Thanks

Please take heed when I say the addition of H2O2 is ***exothermic***, ive already had one member message me that they decided not to use an icebath during the addition and as a result..."lets just say seeing a volcano in his kitchen scared the shit out of my cat lol"

You dont want to scare the shit out of your cat, right?

---

1 Precipitate from side reaction.jpg (4107 kB, 5312x2988 - viewed 521 times.)

3 Dirty amide maybe upon full ether evap.jpg (4254.12 kB, 5312x2988 - viewed 321 times.)

4 Amide after IPA evaporation, still dirty.jpg (4283.4 kB, 5312x2988 - viewed 704 times.)

FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES.pdf (167.16 kB - downloaded 398 times.)

« *Last Edit: June 25, 2017, 05:48:30 PM by Vesp* »

Report to moderator Logged

It's a war on personal freedom, that's what it is.

superlative

Subordinate Wasp

Posts: 140

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #1 on:** October 17, 2014, 07:30:37 PM »

try to rextallize in water. Do they dissolve in RT water? from what i heard the extract from the ether or DCM yeilded long hexagonal crystals, but they dissolved in RT water. so its not an amide. They should dissolve in hot water and form small star/needle like structures.

Report to moderator Logged

WazOne

Larvae

Posts: 41

Trial and Error

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #2 on:** October 17, 2014, 07:37:14 PM »

Have you heated this " amide " ? If so what was the results , melting point etc . Did it revert back to the amide. Is it water soluble etc.
looks like a mixed bag in picture 4. Crystallize on a larger surface area to get a better look at the crystals structure

Report to moderator Logged

R.E.D

thewire

Dominant Wasp

Posts: 426

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #3 on:** October 17, 2014, 09:51:23 PM »

Well done Mate!
https://www.thevespiary.org/talk/index.php?topic=3120.msg40457;topicseen#msg40457

Report to moderator Logged

Scarecrow

Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #4 on:** October 18, 2014, 09:03:21 AM »

Recrystalized in water, was insoluble in water at room temperature, dissolved fully in boiling water, upon leaving to cool yeilded 4g of yellow chunky crystals. This was then vacuum filtered and washed with acetone (acetone did not dissolve it so good sign I think?)

I dont have a mp apparatus atm. Does anyone know what the boiling point of

it is meant to be? I could distill it under vacuum. I might need to run this again because I was in a rush and id like to do it on a larger scale. After the water recrystallization little star like crystals formed around the edge of the beaker and moved inwards. Anyway im going to try the hofmann with 1g and see how it goes. Going to use the method dingbow outlined in the rearrangement thread.

Report to moderator Logged

It's a war on personal freedom, that's what it is.

thewire
Dominant Wasp
Posts: 426

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #5 on:** October 18, 2014, 11:17:23 AM »

Quote from: Scarecrow on October 18, 2014, 09:03:21 AM

> Recrystalized in water, was insoluble in water at room temperature, dissolved fully in boiling water, upon leaving to cool yeilded 4g of yellow chunky crystals. This was then vacuum filtered and washed with acetone (acetone did not dissolve it so good sign I think?)
>
> I dont have a mp apparatus atm. Does anyone know what the boiling point of it is meant to be? I could distill it under vacuum. I might need to run this again because I was in a rush and id like to do it on a larger scale. After the water recrystallization little star like crystals formed around the edge of the beaker and moved inwards. Anyway im going to try the hofmann with 1g and see how it goes. Going to use the method dingbow outlined in the rearrangement thread.

Boiling point? Are we talking about Alpha - Methyl - 3,4-methylenedioxypheny-propionamide.? It melts at 123 C (from benzene), forms white flakes. (Journal of the American Chemical Society, Vol. 62. Feb. 1940, pp. 425-428)
High molecular weight acid amides meant to be solids at room temperature.

Quote

> I was in a rush and id like to do it on a larger scale.

Where are you rushing? Chemistry is not about rushing. You put yourself and others in danger. Specially on large scale.

Simple melting point determination:
http://www.sciencelabsupplies.com/Melting_Point_Apparatus_Simple.html

« Last Edit: October 18, 2014, 11:20:56 AM by thewire » Report to moderator Logged

Scarecrow
Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #6 on:** October 18, 2014, 01:04:59 PM »

I was just in a rush because of some prior commitments at the time I commenced the amide preparation. It was really just to test if it would work out. The 'amide' was then used in a Hofmann degredation following the method outlined by Dingbow in the Hofmann rearrangement thread.

Sodium hydroxide (1.256g .0314mol) was dissolved in 100ml of water and allowed to cool in an ice bath. Upon hitting 4 degrees, to the solution was

added TCCA (500mg, .00628mol/3) and stirred keeping the temp between 0-5 degrees, until full dissolution of the TCCA. To this solution, was added 'amide' (1.3g .00628mol) and allowed to stir, after full dissolution for 2 hours, keeping the temp between 0 and 5 degrees. After 2 hours, the ice bath was replaced with boiling water and stirred for 25 minutes, maintaining a temperature of between 70 and 85 degrees, giving a dark orange solution. This solution was then poured into a sep funnel whilst still hot, and extracted 3 times with DCM (be careful the DCM will boil if you add it too quick). To about 150ml of DCM was added 15ml of 2% HCl solution, which with a light pinky orange colour upon addition and hopefully extraction of MDA HCl. The water solution was tested to have a pH of <5. This solution is now evaporating il update on what I get….

« Last Edit: October 18, 2014, 06:07:28 PM by Scarecrow » Report to moderator Logged

It's a war on personal freedom, that's what it is.

thewire

Dominant Wasp

Posts: 426

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #7 on:** October 18, 2014, 01:58:32 PM »

> **Quote**
>
> This solution was then poured into a sep funnel whilst still hot, and extracted 3 times with DCM

Oh, dude! Why you didn't let cool down your resulting mixture?Amine should float on top by the way.
Never extract hot reaction mixtures in a separatory funnel!
And don't forget to destill your amine (twice) to make sure it is free from 2-Cl-4,5-MDA (http://dx.doi.org/10.1016/j.forsciint.2012.10.002).
Anyway,I like your writeup .

I'm afraid you will get cyanide rather than amine with TCCA.

« Last Edit: October 18, 2014, 05:24:14 PM by thewire » Report to moderator Logged

Scarecrow

Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #8 on:** October 18, 2014, 06:06:35 PM »

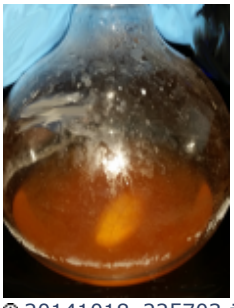
Purely because I followed Dingbows write up closely, its not something I would usually do.

> **Quote**
>
> Been away for a while, but I did run another batch of amide and scaled up a TCCA hofmann (25g amide). Heres the procedure I used:
> -used equimolar amount of TCCA to amide
> -1.5L h20 to 25g amide.
> -Cool solution of NaOH down to 18c.
> -Add TCCA, stir vigorously until FULLY dissolved, this is important. Some very slight foaming will occur. Do no proceed until it is all dissolved.
> -Add amide in 5-10g portions, continue stirring vigorously, only add portions once the previous one is completely dissolved. Took something like 20-30min for each portion to dissolve. Also maintain 18c temperature, using ice bath if necessary.
> -Once the solution is free of any solids and appears a somewhat opaque but still clear solution, raise temperature rapidly to 75c. Once this temperature is reached, hold for 30min.
> -extract and work up as usual

> I got something along the lines of 65% equimolar yield from memory, with the reaction being completed within 3hrs to reach extraction phase.

At the end of the Hoffman, I just had a orange homogeneous solution, so no amine floating on top, then again I moved it from stirring straight to the sep funnel so wasnt paying heaps of attention.. You can sort of see it in this picture.
I extracted it straight away with HCl, so in order to distill it I would have to basify, separate the amine layer it then distill under pressure yes?
Now im worried, I was going to wait for this water to evap then try it tomorrow, but id rather not if its just going to be cyanide...
After reading that article I am a little comforted that I used equimolar TCCA so hopefully, I guess this article proves the importance of doing a bisulfite quench before heating during the degradation?

By the way thanks for the link to the cheap mp apparatus, my local supplier wont charge me anything less than $1000



20141018_225703.jpg (2841.18 kB, 2609x3353 - viewed 183 times.)

« *Last Edit: October 18, 2014, 06:21:01 PM by Scarecrow* » Report to moderator Logged

It's a war on personal freedom, that's what it is.

Scarecrow
Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #9 on:** October 18, 2014, 06:33:24 PM »

The colour changes stated by poisioninthestain are exactly the same with the colour changes I experienced, yellow/clearish solution at first, then dark orange red upon heating

> **Quote from: poisoninthestain on January 06, 2014, 01:43:58 AM**
>
> The worst TCCA yield I've seen so far...typically one can reach up to 50% w/w yield if slow addition of TCCA occurs along with with a post rxn bisulfite quench...
>
> 3.8g 99% technical grade TCCA
> 10g amide
> 800ml H2O
> NaOH 10g NaOH +10g NaOH at 45C not to exceed 70-80C
>
> Powdered TCCA is added to prechilled 5-10C hydroxide solution and stirred until dissolution which is complete in approx. 20min. Amide is added while maintaining temperature parameters previously mentioned. Now, the amide-water suspension is mag. stirred for roughly 30min or until the amide appears to be dissolved into an almost turbid opaque solution that will seem almost clear at times with or without a yellow tinge. When this color change occurs the flask is heated to 70C and held there for 20-30min. At approx. 45C an additional eq. of NaOH may be added to hasten the steady rise in temp and also promote isocyanate hydrolysis.
>
> Usually at 60-70C the reearrangement will occur resulting in a color change from yellow-

> orange-red varying greatly upon your reaction parameters. In this trial, as well as several others, the reaction was removed from external heating up noting the flask color begin to change from a yellow into an orange. While the flask is still warm the solution is extracted once with 100ml xylene and twice at rt. The extracts are then pooled together and filtered on a buchner. The negligable amounts of filtrand were discarded. The filtrate is left to sit in a sep. funnel for 72h at which point a dark precip will crash out which is vac. filtered and discarded.
>
> The now less dark extract (hopefully) is washed twice with an equal part brine and dried over anhydrous K2CO3. The extract is typically honey yellow at this point which is then gassed, chilled, washed with dry acetone, and dried to yield a white brittle solid. Yield 20% w/w..as the hydrochloride. + to both Marquis and Mandelin reagents.
>
> ...i have yet to attempt hydrolysis of the urethane through MeOH and TCCA followed by addition to preheated NaOH and then steam distillation of the amine azeotrope as this seems the best way to go...

Hoping for the best, although I didnt add that extra bit of NaOH to 'promote isocyanate hydrolysis' :S

Report to moderator Logged

It's a war on personal freedom, that's what it is.

thewire

Dominant Wasp

Posts: 426

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

« **Reply #10 on:** October 18, 2014, 09:46:14 PM »

Quote

There is a big mess now in your reaction mixture.

I dont really understand why you waste your aldehyde, time, reagents an uncertian reaction. Why don't you follow the good old scientific literature's instructions?
I dont say it doesn't work , just a bit dodgy. Very low yield, not wery well written instructions etc.

> **Quote**
>
> I extracted it straight away with HCl, so in order to distill it I would have to basify, separate the amine layer it then distill under pressure yes?

Are you at this point ?
If so, evaporate about 5 ml of this solution to dryness. If the solid gives positive result to Marquis and Mandelin reagents, you have got amine.HCL in the solution. If the test is negative, I am afraid you will have to start the full synthesis all over again. In a worst-case scenario the whole write up is fake.

Perform the below procedure if positive.
Liberate the amine (basifiy it with either NaOH or KOH solution, you should smell the free base amine), and steam destill it. If you extract it with solvent again, it will extract some or a lot of cyanuric acid and other by products (depending on a solvent nature). As far as I know MDA free base is steam volatile (some say no, some say yes . more info over here :http://www.lycaeum.org/forum/index.php?topic=3501.0). Everyting else which is water soluble(in our case cyanuric acid) will remain in the water phase. After steam destillation (you shoud smell the amine in the distillate and it should be alkaline to litmus paper)) extract it with solvent (toluene , benzene, DCM etc. 3-4 times about 50 ml). Extracts shell be merged, dried, concentrated under reduced pressure to about 15 mls, let it cool down and

dry hcl gas shell be bubbled through it. You know the rest I suppose.
At this point there is still some Cl -MDA in it. If you want pure product the purification process is longer. The solvent free amine needs to be distilled under reduced pressure and than gasified with dry hcl. Purification is essential, absolutely must in my opinion.

« *Last Edit: October 19, 2014, 11:30:54 AM by thewire* » Report to moderator Logged

thewire
Dominant Wasp
Posts: 426

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #11 on:** October 18, 2014, 10:04:39 PM »
Quote

An Efficient Method for the Hofmann Degradation of Amides by Use of Benzyltrimethylammonium Tribromide
Shoji Kajigaeshi, Kohichi Asano, Shizuo Fujisaki, Takaaki Kakinami, Tsuyoshi Okamoto

Chem. Lett 1989. 463-464

SODIUM BROMITE: A NEW REAGENT FOR THE HOFMANN DEGRADATION OF AMIDES
Shoji Kajigaeshi, Takashi Nakagawa, Shizuo Fujisaki, Akiko Nishida, Michihiko Noguchi

chem lett 1984 p713-714

CL 1989 463-464.pdf (142.63 kB - downloaded 86 times.)
chem lett 1984 713-714.pdf (168.87 kB - downloaded 94 times.)

« *Last Edit: October 18, 2014, 10:11:16 PM by thewire* » Report to moderator Logged

Scarecrow
Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #12 on:** October 19, 2014, 04:28:24 AM »
Quote

I followed Dingbow while also referring to this

US_7205440_B2.pdf (701.52 kB - downloaded 145 times.)

Report to moderator Logged

It's a war on personal freedom, that's what it is.

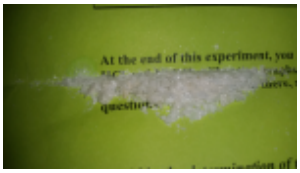
Scarecrow
Dominant Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #13 on:** October 19, 2014, 04:41:40 AM »
Quote

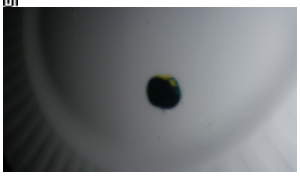
Posts: 430

For steam distilling amine, is dripping hot water in through an addition funnel sufficient? Or is there a better way with external steam. Ive never tried using dry HCl gas ive heard so many mixed things on the best way to do it etc.

Got this after an acetone wash which left purple acetone behind. Mandelin test went straight to blue/black with lots of popping and fizzing... surely a good sign?



1.jpg (4049.84 kB, 5312x2988 - viewed 320 times.)



Mandelin.jpg (3471.19 kB, 5312x2988 - viewed 119 times.)

« *Last Edit: October 19, 2014, 10:00:22 AM by Scarecrow* » Report to moderator Logged

---

It's a war on personal freedom, that's what it is.

thewire

Dominant Wasp

Posts: 426

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #14 on:** October 19, 2014, 10:42:32 AM »

Quote from: Scarecrow on October 19, 2014, 04:41:40 AM

> For steam distilling amine, is dripping hot water in through an addition funnel sufficient? Or is there a better way with external steam. Ive never tried using dry HCl gas ive heard so many mixed things on the best way to do it etc.
>
> Got this after an acetone wash which left purple acetone behind. Mandelin test went straight to blue/black with lots of popping and fizzing... surely a good sign?

Yes , it is positive. You have got your desired compound.
http://www.pillreports.com/index.php?page=display_pill&id=29918

Quote

> For steam distilling amine, is dripping hot water in through an addition funnel sufficient?

Partly sufficient. It doesn't have to be hot water rt temperature is also fine, obviously hotter the better. The reaction flask needs to be warmed during distillation.
http://www.instructables.com/id/DIY-Kitty-Crack%3A--ultra-potent-catnip-extract/step1/crash-course-in-steam-distillation/
I would go with this procedure (Fig. 15.9 Apparatus for steam distillation. leaving out splash head):
http://www.eplantscience.com/index/dean/vacuum_or_reducedpressure_distillatior

Alternative HCl salt preparation can be found here:
https://www.erowid.org/library/books_online/pihkal/pihkal100.shtml

TCCA is very dangerous both in acidic and alkaline solutions! I would try to avoid using it
http://www.sciencemadness.org/talk/viewthread.php?tid=24088

« *Last Edit: October 19, 2014, 03:02:53 PM by thewire* » Report to moderator Logged

CHEMICALCOWBOY36

Subordinate Wasp

Posts: 222

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #15 on:** October 19, 2014, 04:49:34 PM »

Quote from: thewire on October 18, 2014, 09:46:14 PM

There is a big mess now in your reaction mixture.

I dont really understand why you waste your aldehyde, time, reagents an uncertian reaction. Why don't you follow the good old scientific literature's instructions?
I dont say it doesn't work , just a bit dodgy. Very low yield, not wery well written instructions etc.

Quote

I extracted it straight away with HCl, so in order to distill it I would have to basify, separate the amine layer it then distill under pressure yes?

Are you at this point ?
If so, evaporate about 5 ml of this solution to dryness. If the solid gives positive result to Marquis and Mandelin reagents, you have got amine.HCL in the solution. If the test is negative, I am afraid you will have to start the full synthesis all over again. In a worst-case scenario the whole write up is fake.

Perform the below procedure if positive.
Liberate the amine (basifiy it with either NaOH or KOH solution, you should smell the free base amine), and steam destill it. If you extract it with solvent again, it will extract some or a lot of cyanuric acid and other by products (depending on a solvent nature). As far as I know MDA free base is steam volatile (some say no, some say yes . more info over here :http://www.lycaeum.org/forum/index.php?topic=3501.0). Everyting else which is water soluble(in our case cyanuric acid) will remain in the water phase. After steam destillation (you shoud smell the amine in the distillate and it should be alkaline to litmus paper)) extract it with solvent (toluene , benzene, DCM etc. 3-4 times about 50 ml). Extracts shell be merged, dried, concentrated under reduced pressure to about 15 mls, let it cool down and dry hcl gas shell be bubbled through it. You know the rest I suppose.
At this point there is still some Cl -MDA in it. If you want pure product the purification process is longer. The solvent free amine needs to be distilled under reduced pressure and than gasified with dry hcl. Purification is essential, absolutely must in my opinion.

so let me get this straight wire your saying the tcca write up is bullshit and doesn't work ? Do you have any proof?
I dont think elder bee would let a bogus synthesis continue or would they to keep the sweet H nectar safe!

Also if this is fake do you have any literature on a better yielding hoffman because the bleach one sucks for yield and my cat doesn't want to waste his beautiful H nectar or amide !

Report to moderator Logged

In this, you must never lapse. Even those who would be our allies would not understand. Our domain is the shadow. Stray from it reluctantly, for when you do, you must strike hard ,fast and fade away... Without a trace.

thewire

Dominant Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #16 on:** October 19, 2014, 05:41:14

Posts: 426

PM »

Quote

> so let me get this straight wire your saying the tcca write up is bullshit and doesn't work ? Do you have any proof?]so let me get this straight wire your saying the tcca write up is bullshit and doesn't work ? Do you have any proof?

Probably it does work , because NaOCl forms in situ. But at the same time the produced NaOCl reacts with the TCCA as well. Which is potentially dangerous specially on large scale.

Quote

> Also if this is fake do you have any literature on a better yielding hoffman because the bleach one sucks for yield and my cat doesn't want to waste his beautiful H nectar or amide !

Hoffmann Reaction
http://about.mdma.ch/000495809.html

70 % yield
"p-(2,5-Dimethoxyphenyl)-isopropylamine Hydrochloride.-The Hofmann reaction on the foregoing amide was
carried out as usual except that the amide was added dissolved in dioxane to the hypochlorite solution.12 The
yield of distilled amine (b. p. 137-140" (3mm.)) was 70%.
The hydrochloride, prepared in the usual way (v. s.),
crystallizes in fine prisms melting a t 117.5'."

Amines Related to 2,5-Dimethoxyphenethylamine.1 II.pdf (417.96 kB - downloaded 109 times.)

« *Last Edit: October 19, 2014, 05:53:47 PM by thewire* »

Report to moderator Logged

CHEMICALCOWBOY36

Subordinate Wasp

Posts: 222

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #17 on:** October 19, 2014, 06:48:31 PM »

Interesting but can this be done with out an distillation setup ? Because my cat has yet to acquire one ? Then mayb just 3x recrystallization to clean to the amine up ?

Report to moderator Logged

In this, you must never lapse. Even those who would be our allies would not understand. Our domain is the shadow. Stray from it reluctantly, for when you do, you must strike hard ,fast and fade away... Without a trace.

thewire

Dominant Wasp

Posts: 426

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #18 on:** October 19, 2014, 07:05:38 PM »

Quote from: TCdboy28 on October 19, 2014, 06:48:31 PM

> Interesting but can this be done with out an distillation setup ? Because my cat has yet to acquire one ? Then mayb just 3x recrystallization to clean to the amine up ?

Which distillation are refering to? Steam or vacuum? Both can be omitted but it will reduce the purity significantly.

Report to moderator Logged

CHEMICALCOWBOY36

Subordinate Wasp

Posts: 222

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #19 on:** October 19, 2014, 07:35:58 PM »

Both actually lol I was afraid you would say that ! My cat wants the purest possible product he can get his lil paws on damn guess hes just going to have to save up for a distillation setup or will that diy setup you posted work?

Report to moderator Logged

In this, you must never lapse. Even those who would be our allies would not understand. Our domain is the shadow. Stray from it reluctantly, for when you do, you must strike hard ,fast and fade away... Without a trace.

CHEMICALCOWBOY36

Subordinate Wasp

Posts: 222

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #20 on:** October 19, 2014, 07:58:43 PM »

Quote from: Scarecrow on October 16, 2014, 05:39:30 PM

"FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES" which can be found attached. This patent describes a one pot synthesis from Aldehyde to Amide, something that may be useful for people here on this forum. This was recently attempted by a friend who would like the advice of some more experienced bees.

Aldehyde (10g 0.05mol)
Hydroxylamine (3.137g .095 mol) in 100ml of DMSO
Potassium Hydroxide (7.8g in 30ml)
Hydrogen Peroxide (70ml)

Aldehyde (0.5mol, 10g) was added to a solution of Hydroxylamine hydrochloride (.095mol, 3.3137g) in DMSO (100ml). The resulting solution was heated for 60 minutes at 100* over boiling water with vigorous stirring. (Note: Colour changed from clearish to rich light yellow, with smell of seaweed). Upon removal of heat, 30ml of 25% Potassium Hydroxide solution was slowly added over 2 minutes. This changed the colour from light yellow to a dark red/brown. The solution was then put in an ice bath, and hydrogen peroxide (75ml 30%soln) was slowly added with stirring. (The patent calls for the hydrogen peroxide to be added whilst the reaction is still hot, my friend tried this on his first attempt and the RBF took off like a "soyuz rocket" tehe so decided to use an ice bath during the addition of the hydrogen peroxide this time, he assumes the selective hydrolization of the nitrile is quite exothermic...). After the exothermic addition was complete, the solution was extracted with 200ml of ether in a sep funnel. The water layer was thick with some unidentified precipitate, so both layers were vacuum filtered, yielding 40g of which upon recrystalization formed unknown long needle like crystals which can be seen in picture 1. The ether extract was then dried with MgSO4, and distilled to near dryness which left a yellow liquid which can be seen in picture 2. This was then left to evaporate, yielding dirty yellow crystals which can be seen in picture 3. To this was added cold IPA, in which the (amide?) was insoluble, so the IPA/amide solution was heated to boiling until full dissolution. Upon cooling no crystals formed, so the IPA was left to evaporate which left the crystals which can be seen in picture 4, which are still slightly dirty. Needle like crystals have formed.

These crystals weighed in at 6g, not too bad considering my friend only did 1 ether extract because he was in a rush and there were a few unknowns he was toying with. Not sure if this is amide or not, it weighs in approximately the right amount and seems to be consistent with the patent. My friend thinks he may be able to increase yield by using more excess of hydroxylamine to drive aldoxime formation.

Any advice from other bees? These crystals need to be purified more, perhaps an acetone

wash, and/or recrystallization in Toluene? My friend will do an m.p test when he gets the chance..

Thanks

Great job scarecrow me and another fellow bee have been trying to get this damn thing to work for months !
https://www.thevespiary.org/talk/index.php?topic=4179.0

but it seems we didnt heat long enough only for 30 minutes instead of the full 60 like you did
Also can another solvent be used besides ether ? Dcm mayb?

« *Last Edit: October 19, 2014, 08:26:31 PM by TCdboy28* » Report to moderator Logged

---

In this, you must never lapse. Even those who would be our allies would not understand. Our domain is the shadow. Stray from it reluctantly, for when you do, you must strike hard ,fast and fade away... Without a trace.

thewire
Dominant Wasp
Posts: 426

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #21 on:** October 19, 2014, 08:07:08 PM »

Quote from: TCdboy28 on October 19, 2014, 07:35:58 PM

> Both actually lol I was afraid you would say that ! My cat wants the purest possible product he can get his lil paws on damn guess hes just going to have to save up for a distillation setup or will that diy setup you posted work?

Vacuum distillation is definitly not for beginners.
(Fig. 15.5 Apparatus for vacuum distillation.
http://www.eplantscience.com/index/dean/vacuum_or_reducedpressure_distillatior
you will also need a vacuum pump)
Steam dist is fine, quite simple and it requires inexpensive (compared to vac dist) equipments.
Steam dist. combined with extraction, plus recrystallization could provide you about >95 % pure product (this is just an estimate).
With vacuum dist. above 99% if the whole synthesis was done properly.

Report to moderator Logged

CHEMICALCOWBOY36
Subordinate Wasp
Posts: 222

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #22 on:** October 19, 2014, 08:11:42 PM »

Quote from: thewire on October 19, 2014, 08:07:08 PM

> **Quote from: TCdboy28 on October 19, 2014, 07:35:58 PM**
>
> > Both actually lol I was afraid you would say that ! My cat wants the purest possible product he can get his lil paws on damn guess hes just going to have to save up for a distillation setup or will that diy setup you posted work?
>
> Vacuum distillation is definitly not for beginners.
> (Fig. 15.5 Apparatus for vacuum distillation.
> http://www.eplantscience.com/index/dean/vacuum_or_reducedpressure_distillation.php you

will also need a vacuum pump)
Steam dist is fine, quite simple and it requires inexpensive (compared to vac dist) equipments.
Steam dist. combined with extraction, plus recrystallization could provide you about >95 % pure product (this is just an estimate).
With vacuum dist. above 99% if the whole synthesis was done properly.

---

thanks wire my cat want that 99% but will have to settle on 95 till he has the proper knowledge and equipment

Report to moderator Logged

In this, you must never lapse. Even those who would be our allies would not understand. Our domain is the shadow. Stray from it reluctantly, for when you do, you must strike hard ,fast and fade away... Without a trace.

thewire
Dominant Wasp
Posts: 426

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote
« **Reply #23 on:** October 19, 2014, 08:23:24 PM »

Great job scarecrow me and another fellow bee have been trying to get this damn thing to work for months ! Also can another solvent be used besides ether ? Dcm mayb?

Yes, it can be used. Any non water miscible solvent works . Low boilling point ones are prefered (because they can be removed on atmospheric pressure). Ether, dicloremethane , chloroform, maybe petrolether, toluene (this one has a high boiling point)

99 % pure product would meet FDA approval drugs , which are very pure (>99%).
I presume most of the people would be very happy with the 95 stuff as well.
« *Last Edit: October 19, 2014, 08:25:38 PM by thewire* » Report to moderator Logged

thewire
Dominant Wasp
Posts: 426

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote
« **Reply #24 on:** October 19, 2014, 08:28:12 PM »

Hofmann rearrangement of diphenylacetamide & ??-diphenylpropionamide. Schiff's base as a new by-product of the Hofmann reaction. Benzhydryl-amine from diphenylacethydroxamic acid†

Aziz-Ur Rahman and M. O. Farooq
DOI: 10.1002/recl.19540730511

Organic Reactions Volume 03 (1946) page 280
General procedures for Hofmann reaction

Hofmann rearrangement of diphenylacetamide.pdf (421.12 kB - downloaded 78 times.)
Organic Reactions 03 (1946) s.pdf (5402.98 kB - downloaded 66 times.)

« *Last Edit: October 19, 2014, 08:32:20 PM by thewire* » Report to moderator Logged

Scarecrow

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES Quote

Dominant Wasp

Posts: 430

INTO AMIDES results

« **Reply #25 on:** October 20, 2014, 05:52:49 AM »

Thanks for the feedback everyone its been great, im glad I can contribute. In terms of solvent thewire, just use Xylene/Toluene or some other non-polar that you have access too.

The yields for this process I believe will be possible to get quite high, but because this was the first time running this I definitely lost yield during both steps.

I was recently informed that apparently the amide is soluble in acetone, which is strange because after I got my initial batch of amide crystals from letting the ether evaporate, at some point I gave the amide crystals an acetone wash which decoloured them a bit, so i could have potentially lost a lot there.

> **Quote from: Scarecrow on October 18, 2014, 09:03:21 AM**
>
> Recrystalized in water, was insoluble in water at room temperature, dissolved fully in boiling water, upon leaving to cool yeilded 4g of yellow chunky crystals. This was then vacuum filtered and washed with acetone (acetone did not dissolve it so good sign I think?)
>
> I dont have a mp apparatus atm. Does anyone know what the boiling point of it is meant to be? I could distill it under vacuum. I might need to run this again because I was in a rush and id like to do it on a larger scale. After the water recrystallization little star like crystals formed around the edge of the beaker and moved inwards. Anyway im going to try the hofmann with 1g and see how it goes. Going to use the method dingbow outlined in the rearrangement thread.

As for the one pot to amide from aldehyde, for the next run I think that to increase yields, I will use slightly more molar excess of Hydroxylamine.HCl, and also considering not putting my reaction mixture under an ice bath as I add H2O2, and just use a thermometer to monitor the temperature, although you need to be very careful doing this as the addition of H2O2 is highly exothermic.

Once the ether (or whatever solvent you have used for amide extraction, ive been informed ether is not a good solvent for this perhaps DCM would be ideal) has been concentrated and evaporated to yield rough crystals, recrystalisation in boiling water one or two times should be enough, as I did a plethora of mistakes during this part of the work up which includes washing it in acetone....

The amide should be ready for the Hoffman After 1 or 2 recrystalizations in boiling water, I recommend grinding your amide chunks into as fine of a powder as possible before using it in the degradation.

I didnt get anywhere near Dingbows supposed 69% molar yield, I would recommenced following the attached patent (sort of what I did except with a few shortcuts), replacing equimolar NaOCl with 1/3 of the moles of TCCA. I think doing a bisulfate quench before heating will also greatly increase yeilds and decrease formation of Cl.MDA. Does anyone know how to judge how much bisulfate solution to add? Does it matter or can you just flood it with excess to mop up the Cl?

I will give this a full run through again and update on what sort of yields I can get. I ended up with 300mg of HCl out of 1.3g of amide, so not a great yield but im sure it can be improved on (this shit is pure as the devils snow I swear 120mg sent my friend off the planet for a good 5 hours). After I let the HCl extracts evaporate I had very bad dirty crystals, scraping them up and rinsing them with dry acetone yielded pure white crystals of seemingly (tehe) high

purity.

US_7205440_B2.pdf (701.52 kB - downloaded 119 times.)

« *Last Edit: October 20, 2014, 06:01:43 AM by Scarecrow* » Report to moderator Logged

---

It's a war on personal freedom, that's what it is.

CHEMICALCOWBOY36

Subordinate Wasp

Posts: 222

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #26 on:** October 21, 2014, 05:22:44 AM »

Why did you use KOH instead of sodium hydroxide like the original procedure callled for ? Also can dmso be substituted ?

Report to moderator Logged

In this, you must never lapse. Even those who would be our allies would not understand. Our domain is the shadow. Stray from it reluctantly, for when you do, you must strike hard ,fast and fade away... Without a trace.

Scarecrow

Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #27 on:** October 23, 2014, 07:30:21 PM »

Because I ran out of NaOH temporarily. DMSO may be able to be substituted with DMF or THF but im honestly not sure to be honest, there isnt much of a mechanistic study in the patent. DMSO isnt too hard to find though, although its hard to reuse the DMSO in this particular reaction, another member of the forum believes the precipitate you get during formation of the Amide is DMSO that has been turned into MSM.

Report to moderator Logged

It's a war on personal freedom, that's what it is.

Scarecrow

Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #28 on:** October 27, 2014, 05:51:17 AM »

I repeated this experiement except using 7g Hydroxylamine and DCM as an extraction solvent, and my solvent extracts have concentrated to a small amount of yellow liquid that seems to not want to evaporate any further... very strange

Update- I re ran this with 7g Hydroxylamine but extracted with Ether, and no precipitate occured this time during the reaction, waiting for ether to evap now will let you know on yields

« *Last Edit: October 27, 2014, 09:37:29 AM by Scarecrow* » Report to moderator Logged

---

It's a war on personal freedom, that's what it is.

Re: FACILE ONE-POT

CHEMICALCOWBOY36

Subordinate Wasp

Posts: 222

CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #29 on:** October 27, 2014, 07:03:59 PM »

Damn so dcm wont work for extracting ?

Report to moderator Logged

In this, you must never lapse. Even those who would be our allies would not understand. Our domain is the shadow. Stray from it reluctantly, for when you do, you must strike hard ,fast and fade away... Without a trace.

Scarecrow

Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #30 on:** October 28, 2014, 07:28:06 AM »

DCM should work fine, upping the hydroxylamine mole ratio howeveer does not, it yields the ether/DCM extracts with a thick yellow oil

« *Last Edit: October 28, 2014, 07:43:53 AM by Scarecrow* » Report to moderator Logged

It's a war on personal freedom, that's what it is.

CHEMICALCOWBOY36

Subordinate Wasp

Posts: 222

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #31 on:** November 01, 2014, 04:03:46 PM »

Here was what my cat got from a 100g scale reaction

the first picture is what my cat found after trying to filter while hot
the second is what he found after letting the dmso cool in a jar for later filtering

I believe the second picture is the msm that is a side reaction
but what is my first pic the crystals look totally different almost like amide but im not sure because the OP said the amide was in the dmso still and need to be exacted with dcm ?!

which I did its evaporating now

any clue if my cat did it right fellow bees?

20141101_095104.jpg (2493.77 kB, 5312x2988 - viewed 170 times.)

20141101_094838.jpg (3430.81 kB, 5312x2988 - viewed 148 times.)

20141101_094716.jpg (3096.26 kB, 5312x2988 - viewed 192 times.)

« *Last Edit: November 01, 2014, 09:48:59 PM by TCdboy28* »

Report to moderator

Logged

In this, you must never lapse. Even those who would be our allies would not understand. Our domain is the shadow. Stray from it reluctantly, for when you do, you must strike hard ,fast and fade away... Without a trace.

Scarecrow

Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #32 on:** November 03, 2014, 12:14:25 PM »

Save the crystals and wait for your DCM to evap. Then see if the resulting crystals are insoluble in cold water but soluble in hot water and recrystalize. If they are soluble at room temperature then its not amide. Otherwise recrystalize it a few time and get on to making your n-chloramide

Report to moderator Logged

It's a war on personal freedom, that's what it is.

pyrrolidin

Subordinate Wasp

Posts: 121

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #33 on:** November 17, 2014, 11:31:09 PM »

Is this huge excess of hydrogen peroxide really necessary?

In the original work by Wiberg 1953 (http://pubs.acs.org/doi/abs/10.1021/ja01112a025) they used 2 to 3 equivalents h2o2 and sodium carbonate as base. They argue that the mechanism needs 2 molecules of hydrogen peroxide. In the article you quoted they use 11 (!) equivalents. Let's see if this can be optimized to prevent waste. I think letting the reaction sit at room-temperature after addition of the H2O2 may boost the yields a bit since in the original work they let it sit overnight and show that the rate is pretty constant.
One thing to note: "Since the rate of the reaction showed a first-order dependence on the concentration of hydrogen peroxide, the slow step must involve only one molecule of the peroxide, and a successive fast reaction must be responsible for the second hydrogen peroxide molecule required by the stoichiometry."

This means maybe use 40% solution of NaOH instead of 25% and maybe a bit less DMSO?
I will report back.

/edit: OK apparently the DMSO gets oxidized by the H2O2 as well, now my question: Then why use DMSO?
/edit2: Well: "Recently, we demonstrated that aldoximes are readily dehydrated to nitriles with Raney nickel in refluxing 2-propanol.[21] Unfortunately, we also found that the Raney nickel catalyst was poisoned in

the reaction and could not be reused. During our systematic study directed at regenerating the catalyst and exploring other possible dehydrating metal catalysts, surprisingly we discovered that aldoximes readily dehydrate in dimethylsulfoxide (DMSO) solvent at 100 degrees centigrade."

« *Last Edit: November 17, 2014, 11:48:59 PM by pyrrolidin* »Report to moderator Logged

Scarecrow

Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #34 on:** November 27, 2014, 07:52:40 AM »

I just did an 100g run of this and have had mixed results. 100g of Helional, 1.1mol equiv of Hydroxylamine HCl, and 1000ml of DMSO. 700ml of 30% H2O2 was added.

It was strange, after the reaction the reaction flask was held in an ice bath for about half an hour. A lot of precipitate had formed, at first I thought it was MSM but upon closer inspection it looked as if there was amide in there. I filtered this off and threw it away thinking it was MSM. Then I put it in the sep funnel, but uppon putting it in the sep funnel, more crystals precipitated which I then filtered, which were not needle like but flakey and white. These were recrystalized in Xylene, washed with acetone and saved, later used in the TCCA Hoffman to give 3.5g from 10g of what I gues must be amide. Anyway, the rest of the solution was extracted into DCM, then the DCM allowed to evaporate, and then upon leaving it to cool a whole lot of needle like crystals formed which looked different to the crystals that I just mentinoed were used in the Hoffman to give 3.5g MDA. Im not sure what the deal is here, as the crystals from the DCM evap should be Amide, but the Crystals that fell out of solution before DCM extraction were used in the Hofmann giving MDA so im not sure what these needlle like crystals are. The needle crystals were washed in water and acetone, removing yellow colour from them and these were then saved.

Not sure whats going on here. Does anyone know if the Amide is soluble in acetone? Java mentioned that it IS soluble in acetone, but this cannot be correct as the crystals I used for the TCCA hofmann had been washed in acetone. What confuses me is why those crystals worked in the TCCA Hofmann, when the crystals that came from the DCM extract should be the amide but look completely different.

Is there a sure fire way to separate the amide from the rest of these crystals?

Report to moderator Logged

It's a war on personal freedom, that's what it is.

pyrrolidin

Subordinate Wasp

Posts: 121

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #35 on:** November 29, 2014, 04:27:22 PM »

I will run this reaction on a small scale next week hopefully and if I too get precipitate and solids from the DCM extracts I will measure a Proton NMR of both. This should be rather enlightening. Maybe the solubility of the amide isn't so good in DMSO, the amide should be soluble in acetone afaik. The appearance of the crystals is a very weak indicator of which compound this is, please use something more substantial like TLC. Mabye the precipitate was Amide + MSM and you just washed away some amide with the acetone but

there still was enough left for the hofmann (3,5g isn't exactly a spectacular yield, amide might not be pure). Recrystallization from water might be a good way to separate the MSM from the amide.

Have you run a TCCA hofmann with the DCM evapped "amide"?

« Last Edit: November 29, 2014, 04:33:07 PM by pyrrolidin » Report to moderator Logged

CHEMICALCOWBOY36

Subordinate Wasp

Posts: 222

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #36 on:** November 29, 2014, 05:49:51 PM »

Quote from: Scarecrow on November 27, 2014, 07:52:40 AM

> I just did an 100g run of this and have had mixed results. 100g of Helional, 1.1mol equiv of Hydroxylamine HCl, and 1000ml of DMSO. 700ml of 30% H2O2 was added.
>
> It was strange, after the reaction the reaction flask was held in an ice bath for about half an hour. A lot of precipitate had formed, at first I thought it was MSM but upon closer inspection it looked as if there was amide in there. I filtered this off and threw it away thinking it was MSM. Then I put it in the sep funnel, but uppon putting it in the sep funnel, more crystals precipitated which I then filtered, which were not needle like but flakey and white. These were recrystalized in Xylene, washed with acetone and saved, later used in the TCCA Hoffman to give 3.5g from 10g of what I gues must be amide. Anyway, the rest of the solution was extracted into DCM, then the DCM allowed to evaporate, and then upon leaving it to cool a whole lot of needle like crystals formed which looked different to the crystals that I just mentinoed were used in the Hoffman to give 3.5g MDA. Im not sure what the deal is here, as the crystals from the DCM evap should be Amide, but the Crystals that fell out of solution before DCM extraction were used in the Hofmann giving MDA so im not sure what these needlle like crystals are. The needle crystals were washed in water and acetone, removing yellow colour from them and these were then saved.
>
> Not sure whats going on here. Does anyone know if the Amide is soluble in acetone? Java mentioned that it IS soluble in acetone, but this cannot be correct as the crystals I used for the TCCA hofmann had been washed in acetone. What confuses me is why those crystals worked in the TCCA Hofmann, when the crystals that came from the DCM extract should be the amide but look completely different.
>
> Is there a sure fire way to separate the amide from the rest of these crystals?

idk fellow bee it sure is strange the same shit happen to my cat
I believe some how the amide fall out first then the msm and then mayb some amide is left in the mother liquid that need to be extracted?
The only reason my cat even kept the first crystals was because he had ran the original tdogs procedure and that first crystals looked just like the amide he got after doing a cleaning of the dirty brown sand amide from the beckmann

my cat still has a bout 40g left of this suspected amide but earlier this week he tried the tcca hoffman on a about 27.5 grams of the dcm extracted "amide" but I think it faild or my cat messed it up because he didn't have enough dcm to extract the amine any way after the hoffman was preformed he didnt extract while hot like a lot of bees say to do because he was going to be late for work but put it aside for later extraction it was about 1250ml of liquid and he only had 150ml of dcm so I believe there still might have been more amine trapped in the solution . Also after extraction he tryed to gas using a lil hcl gas generator but idk if that worked right either because he first tryed to dry the dcm extraction with MgSO4 but might have went over bored because he used 25grams to dry the 150ml dcm extraction but it didnt go as planned because after drying and filtering he was left with about ~ 100ml of dcm which is weird right ?
also I read that dcm cant be gassed properly because of some solubility issue but that was only for mdma not mda as I later read or he could have fucked

up the hoffman to because like I said he was running late for work that day so he only held the hoffman temp for 20mins then set it aside because he had read this reaction could sustain its self after reach the required temp
also how long are you suppose to hold the 70°-75°c temp for I have read 20mins 30mins or 1 hour ?

this damn synthesis is really starting to piss this bee off but if this art was easy everyone would be doing it lol but my cat wont give up until he has that sweet amine !

Report to moderator Logged

In this, you must never lapse. Even those who would be our allies would not understand. Our domain is the shadow. Stray from it reluctantly, for when you do, you must strike hard ,fast and fade away... Without a trace.

CHEMICALCOWBOY36

Subordinate Wasp

Posts: 222

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #37 on:** December 12, 2014, 05:28:21 PM »

Well either this synthesis is bullshit or this bee skills suck because after an hoffman this be has 0 honey !
We need to figure out which precipitate is the true amide or if it really is trapped in the mother liquid and just needs to be extracted by dcm !
Scarecrow where you at man this bee could really use you help or any bee for that matter or he just going to go back to the original two dog method that he knows works smh this so disappointing no honey for this bees birthday really sucks !!!

First pic is the amide that precipitated out first
second is the dcm extraction amide
sorry my phone camera broke so its a bit fuzzy
third is both side by side got a bout 40g each from 100g synthesis

20141115_123255.jpg (3591.64 kB, 5312x2988 - viewed 183 times.)

20141114_082351.jpg (3659.72 kB, 5312x2988 - viewed 124 times.)

20141115_123219.jpg (3674.12 kB, 5312x2988 - viewed 149 times.)

« Last Edit: December 18, 2014, 07:26:11 AM by TCdboy28 »

Report to moderator Logged

In this, you must never lapse. Even those who would be our allies would not understand. Our domain is the shadow. Stray from it reluctantly, for when you do, you must strike hard ,fast and fade away... Without a trace.

CHEMICALCOWBOY36

Subordinate Wasp

Posts: 222

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #38 on:** December 18, 2014, 07:30:04 AM »

Bump updated post but forgot the pictures

Report to moderator Logged

In this, you must never lapse. Even those who would be our allies would not understand. Our domain is the shadow. Stray from it reluctantly, for when you do, you must strike hard ,fast and fade away... Without a trace.

pyrrolidin

Subordinate Wasp

Posts: 121

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #39 on:** December 28, 2014, 10:08:42 PM »

So finally I've had time to run this rxn. These are the results:

10g aldehyde (52 mmol, 1 equiv) was weighed into a flask containing 100ml DMSO and 3.7g hydroxylamine hydrochloride (53 mmol, 1.05 equiv). The mixture was heated in an open vessel on a boiling water bath and held at 100°C for 65 minutes. The colorless solution did turn from yellow to orange during the course of the reaction. The heating bath was removed and a bath of tap water with some ice (~4°C) was used to cool the reaction mixture. 2.7g NaOH (67.5 mmol, 1.3 equiv) in 70 ml water was added in three portions and the reaction turned deep orange/reddish and quite opaque. After that a dropping funnel charged with 75 ml 30% H2O2 was attached and the peroxide added at a dripping speed of about 2 drops/s. The water from the cooling bath had to be changed once but the reaction went rather smoothly. The color brightened up a bit during the addition of the peroxide and remained at a plain homogenous orange at the end (no solids present). The mixture was flooded with 100ml DCM and then extracted 3 times with 40ml DCM. The organic phases (pale yellow) were washed with tap water twice, dried over sodium sulfate, filtered and evaporated. The light yellow residue was dried in vacuo.

Yield: 12.92 g very light yellow solid (= 120% of theory) before recrystallization

I will measure an Proton NMR of this and we'll see if it's amide or not, as far as I know everything worked like described in the original protocol, haven't got that strange precipitate after the reaction like you guys. I will of course recrystallize it from water in the next days. Looks really good so far.

The only thing I changed from the other posts is I used less base and more diluted. I only had very little NaOH left so I decided to wash the container with water a few times to get all of it out. Maybe because of this the MSM stayed in solution (150g/L in water). Anyway, if there still is MSM present the peaks should be easily identifiable via NMR, there has to be some kind of junk in there else the yield is not possible, probably a mixture of some DCM, MSM and maybe aldehyde. During the reaction there was a quite strong odor of dimethylsulfide, probably because my DMSO isn't very fresh but anyway this could've lead the peroxide oxidating the DMS first and maybe that's because little to no MSM was formed? Wild assumptions though.

« Last Edit: December 28, 2014, 10:45:47 PM by pyrrolidin » Report to moderator Logged

Re: FACILE ONE-POT

pyrrolidin
Subordinate Wasp

Posts: 121

CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #40 on:** December 29, 2014, 04:31:09 PM »

Update:
I think this really is amide. I dissolved the product in ~30 m Ethanol and upon cooling some crystals began to form. After flooding with 250 ml water a whole lot of white precipitate crashed out of solution, this was filtered over a buchner and washed many times with cold water. The product is insoluble in cold water, but washing the beakers that had a little bit of white precipitate in them with hot water from the tap did get rid of it so it seems to be slightly soluble in hot water. Also soluble in acetone. Drying this wet mess was a pain in the ass, got about 100% molar yield (10.8 g) now but I guess there's still some water in there. so the real yield is probably between 85-95%. Product much whiter than before recrystallization.

Report to moderator Logged

pyrrolidin
Subordinate Wasp

Posts: 121

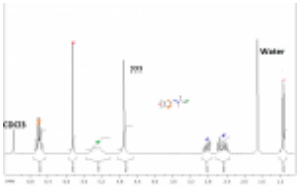
Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #41 on:** January 09, 2015, 05:57:02 PM »

Sorry to triple-post in a row but I think you will find this interesting. The NMR looks good, some water in there as expected and the integrals are superb. However there is one signal at 4.75ppm (a singulet) which I cannot interpret. It's not MSM (singulet around 3ppm) and its not DCM (singulet at 5.3ppm). I've never seen something like this. I will try to recrystallize from water, dissolve in acetone and evap and measure again, hopefully then the water and the other stuff will disappear.

edit: Impurity could be Hydroxylamine hydrochloride. I haven't found literature on the shift but 4.7 seems plausible for the ammonium H's.



nmrmr - Kopie.PNG (20.4 kB, 1173x741 - viewed 165 times.)

« *Last Edit: January 10, 2015, 05:00:04 AM by pyrrolidin* » Report to moderator Logged

CHEMICALCOWBOY36
Subordinate Wasp

Posts: 222

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #42 on:** January 14, 2015, 06:43:13 AM »

Great job fellow be so does this mean we have amide ? Now the second question is it the first crystals that precipitate or is the amide trapped in the mother liquid and needs to be extracted out with dcm ?

Report to moderator Logged

In this, you must never lapse. Even those who would be our allies would not understand. Our domain is the shadow. Stray from it reluctantly, for when you do, you must strike hard ,fast and fade away... Without a trace.

pyrrolidin

Subordinate Wasp

Posts: 121

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #43 on:** January 14, 2015, 10:16:16 PM »

There is no way to know. If you read my posts I stated no crystals precipitated when I ran the reaction, just as in the original procedure. Do a TLC of both crystals, or, if you can't at least recrystallize everything you got (both crystals) from 90% water and 10% EtOH, the less EtOH the better (IPA and MeOH would work too I assume). Let crystallize slowly and wash with cold water. I think the most logic thing would be the DCM extract being amide and the precipitate being gunk but you never know for sure.

And yes, we definitely have pure amide now.

« *Last Edit: January 14, 2015, 10:17:51 PM by pyrrolidin* » Report to moderator Logged

Scarecrow

Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #44 on:** February 06, 2015, 05:27:41 AM »

Great work pyrrolidin! The NMR spectra and modified reaction conditions has been a fantastic contribution to this thread and my work with this reaction, and has been duely noted! I am back from a 2 month break now so more time to play around with this rxn. I am ultimately working towards getting high yielding 100g batches going. Im also looking at the carbamate route but this is still a work in progress.

Pyrro, what can you tell me about the role that the hydroxide addition before the H2O2 plays in the reaction, im trying to figure out the best concentration/molar ratio of NaOH to use, seeminly you used very little and still got good results. I am also thinking about using 50% H2O2 to stop there being so much water being added. Do you think we could use the 2:1 ratio instead of the 11:1 ratio thats used here? That would be great because at the moment adding 700ml of 30% h2o2 takes my 2L flask to nearly full.

Any info you have on the reaction mechanics of this reaction would be great, im going to give a 10g run ago with your reaction conditions very soon and will post results.

Also the dual solvent recrystalization you mentioned will be tried as ive found recrystalizing the amide in hot water or xylene both to be not too flash.

Report to moderator Logged

It's a war on personal freedom, that's what it is.

unlikely_username

Subordinate Wasp

Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #45 on:** February 06, 2015, 06:35:55 AM »

I'm just finishing up my second attempt at pyrrolidin's procedure. The first resulted in an orange oil that refused to crystallize or be purified (various cosolvent extractions/precipitations, bisulfite wash, water wash). I think it's the unconverted nitrile, caused by excessive cooling during the peroxide addition (0-10C). During my second attempt only moderate cooling was used

and I waited for O2 production after peroxide addition to start before applying it (this took a while actually), keeping the temp between 30-60C, added a pinch of EDTA to inhibit metal catalysed peroxide decompisition just because I was reading about the mechanism and they mentioned it. After O2 production subsided the mixture was flooded with 100mL ethyl acetate and extracted twice with 60mL ethyl acetate. After evaporation on a warm hotplate under a stream of air, washing with ice water, and and hour of drying on paper towel a total of 14.2g of damp off-white to slightly yellow tinted crystals were obtained from 12.9g of starting material. I anticipate losing around two grams as they finish drying, but I'll update with a final number. This is an amazing procedure with easy workup .

On a side note, a small quantity of yellow crystalline mass formed during the peroxide reaction and floated on top of the solution, it was discarded as if it contained the target compound it was far less pure than the extraction product.
The peroxide used was 29%, amount was adjusted accordingly. All quantities except during extraction were scaled by a factor of 1.29 (I had exactly that much aldehyde left over).

EDIT: After several hours of drying under a stream of air with occasional stirring and changing of filter paper the final yield is 9.5g amide, turns out the crystals were a bit more wet than I thought . Not bad for a second try though, with only two extractions to boot.

« *Last Edit: February 06, 2015, 09:02:26 AM by unlikely_username* » Report to moderator

Logged

unlikely_username

Subordinate Wasp

Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #46 on:** February 06, 2015, 02:25:17 PM »

Amide successfully underwent Hoffman degradation with household nominal 8.25% bleach solution, abysmal yield (~10% so far), but a successful first attempt is always a good sign. Recrystallization of the amide would likely have increased yields (both by purification and by reducing the excess of hypchlorite present), as would a titration of the bleach, better grinding of the amide before addition (chunks floating around) and better temperature control (ended up adding KOH at nearly 60C instead of 50C) but there were severe time constraints on me and I was pushing it as it was. Could also go the TCCA route, but bleach is so goddamn easy.

Anywho, crystals were very white and fluffy after acetone wash and bioassay of 50mg product for testing purposes was a success, so all is well. The presence of 2-Cl-MDA was not controlled for

Report to moderator Logged

Scarecrow

Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #47 on:** February 08, 2015, 03:27:23 AM »

I highly reccomend using TCCA. Check out this patent

US_7205440_B2.pdf (701.52 kB - downloaded 161 times.)

Report to moderator Logged

It's a war on personal freedom, that's what it is.

Scarecrow

Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #48 on:** February 08, 2015, 03:34:59 AM »

Becuase of the shortcomings of the Hoffman degradation, there is another route I have been exploring. The hoffman degredation yields can be greatly increased by isoliating the n-chloramide intermediate from the Hofmann degredation, and then hydrolyzing this with aqueous hydroxide to give an amine of one less carbon.

So Amide -> N-Chloramide -> Amine

Preparation of N-Chloramides Using TCCA.pdf (112.57 kB - downloaded 129 times.)

Report to moderator Logged

It's a war on personal freedom, that's what it is.

Scarecrow

Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #49 on:** February 22, 2015, 06:30:35 AM »

Sorry for the tripple post

I think perhaps the yellow gunk that I was getting when using 2:1 ratio of hydroxylamine to aldehyde was because the addition of the H2O2 was done too cold, perhaps trying this reaction with a 2x molar excess of Hydroxylamine and making sure the NaOH solution and H2O2 are added at 40*+ may be better?

Report to moderator Logged

It's a war on personal freedom, that's what it is.

b6baddawg

Subordinate Wasp

Posts: 183

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #50 on:** February 23, 2015, 05:36:04 PM »

Ill answer and add some edits to answer more repeated queries bees are uncertain of in this thread.

The amide is too an extent soluble in acetone. unreacted aldoxime in the amide (depressing the mp) is far more soluble. Use ice freezer cold acetone and finely ground dirty impure amide with a sparing acetone vaccuum wash.

Your amide MP merck n buck gave different mps in their literature, 118c & 126c? anything over 110c seems to work fine in either naocl or TCCA long as you prepared it right..

I used the ice cold acetone wash when my amide MP is depressed below 110c and to remove the colour if there was any from the amide crystal. I noticed impure amide even ground fine can 'coat' and remain unreacted in the Hoffman really fucking yields.

I switched from naocl bought from supplier because I couldn't be sure of its concentration, it degrades and can also be several % higher than it says on the label. I found out the expensive way..
So I use TCCA Hoffman now it scales up ok.

zinc nitrate can be used in a one pot aldehyde>amide btw. use less catalyst than the paper states (think it said 15% try about 8% or less) and xylene not toluene iirc I tried zinc nitrate hexahydrate using toluene n got an orange goo. icky.
Or nickel acetate works in the one pot too.
all these 'one pots' use a larger molar amount of hydroxylamine, I wonder why? just personal curiosity if anyone has the answer..
Best I heard of aldehyde to amide in one pot was 87% molar and that was quite some time ago.

« *Last Edit: February 23, 2015, 06:25:53 PM by b6baddawg* »

Report to moderator
Logged

uchiacon
Subordinate Wasp

Posts: 234

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #51 on:** February 26, 2015, 09:32:43 PM »

Quote from: Scarecrow on October 28, 2014, 07:28:06 AM

> DCM should work fine, upping the hydroxylamine mole ratio howeveer does not, it yields the ether/DCM extracts with a thick yellow oil

thick yellow oil means helio aldoxime. that would be my guess. Clearly excess hydroxylamine is meaning your reaction doesnt run to completion.

If you are pioneering reactions for bees you really need a mp apparatus to know what you are getting. Trawl ebay for a few months. Expect to spend 200-400$. I commend you for your efforts.

« *Last Edit: February 26, 2015, 09:37:40 PM by uchiacon* »

Report to moderator Logged

thewire
Dominant Wasp

Posts: 426

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #52 on:** March 02, 2015, 10:42:31 PM »

Reduction of Carboxamides to the corresponding Amines

http://bitnest.ca/Rhodium/chemistry/amide2amine.acyloxyborohydride.html

Report to moderator Logged

Uppy
Larvae

Posts: 37

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #53 on:** March 15, 2015, 04:21:09 AM »

My apologies if this has already been covered, but what is the specific weight of the amide? I'm coming up short on info with this particular amide.

Report to moderator Logged

luminouspath

Subordinate Wasp

Posts: 191

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #54 on:** March 15, 2015, 10:50:48 AM »

> **Quote**
>
> My apologies if this has already been covered, but what is the specific weight of the amide? I'm coming up short on info with this particular amide.

Not sure why you need the specific weight, but you could work it out from the molecular weight which is 207.25g/mole.

Report to moderator Logged

Uppy

Larvae

Posts: 37

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #55 on:** March 15, 2015, 05:47:44 PM »

Yep, that's what I was after, idk why I was thinking specific weight... thanks luminous

Report to moderator Logged

Uppy

Larvae

Posts: 37

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #56 on:** April 05, 2015, 09:11:34 AM »

Scarecrow, I'm a little confused with your first post, you mention after distilling to dryness you were yielded a yellow liquid which then was evaporated to yield crystals. It sounds like this was a simple distillation to yield the crude amide. Where it yielded a liquid, It seems likely the temp would've likely been around 122*C if that is indeed the mp of the amide. At that point where theres no solvent left wouldn't further evaporation of the amide liquid simply allow it to succumb to atmospheric absorption? I would think that that liquid would crystallize as it cools under the melting point. That 3rd pic though definitely looks like evaporating liquid and crystals...

Both Pyrrolydin and Unlikely mention evaporation after extraction also, with seemingly minimal warming so it makes sense they obtained a solid substance (under the melting point), as the solubility decreased with the change in volume?

With that said, might it be possible to cool the final solvent extraction to precipitate the amide as opposed to evaporation? Lowering the solvent temp would decrease solubility right?

« Last Edit: April 05, 2015, 09:28:36 AM by Uppy »

Report to moderator Logged

Scarecrow

Dominant Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

Posts: 430

« **Reply #57 on:** April 06, 2015, 04:47:28 AM
»

When I said I distilled the yellow liquid. It was ether with amide dissolved in it. I distilled the solvent off to leave behind crystals. You can just evap the solvent if you want.

Report to moderator Logged

It's a war on personal freedom, that's what it is.

Uppy

Larvae

Posts: 37

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #58 on:** April 22, 2015, 06:26:40 AM
»

The original Synthcomm paper is pretty vague on the mechanism but I ran across this (attached) article which hopefully may add some clarity to the dehydration of the aldoxime:

> **Quote**
>
> "...the reaction of aldehydes with NH2OH·HCl in DMSO could generate aldoximes in the absence of an added base, and the HCl associated with hydroxylamine would concurrently activate DMSO. The 'activated DMSO' would subsequently facilitate the dehydration of aldoximes."
>
> "The interaction of HCl (associated with hydroxylamine hydrochloride) with DMSO yields an oxysulfonium salt...The intermediate instantaneously reacts with aldoxime...via electrophilic addition."
>
> "To authenticate the role of DMSO and HCl in nitrile synthesis, the (aldoxime) was reacted with DMSO at 90 °C in the presence of a catalytic amount of 4 M HCl... 96% yield. Conversely, under similar conditions when HCl was omitted, we did not observe any reaction... Likewise all other solvents failed to promote the dehydration of aldoxime indicating the requirement for DMSO in the process...These observations also prove that the process is not an acid-catalyzed dehydration, but is driven by 'activated DMSO' and the role of HCl is limited to that of a catalyst to activate DMSO."

This article is also discussed somewhat over at SM:
http://www.sciencemadness.org/talk/viewthread.php?tid=26038

Maybe those wierd crystals you guys are getting is that intermediate oxysulfonium salt?

Found a good video explaining aldoxime formation via Hydroxylamine:
https://www.youtube.com/watch?v=Ph6EMwosuCY

In regards to H202 hydrolysis, I've attached a copy of Wiberg's work as referenced as well as "Mechanism of the base-catalyzed conversion of nitriles to amides"

Hope this helps!
Uppy

A Practical and Cost-Efficient, One-Pot Conversion of Aldehydes into Nitriles Mediated by 'Activated DMSO' .pdf (40.1 kB - downloaded 100 times.)
(Wiberg) Mechanisms of Hydrogen Peroxide Reactions. I. The Conversion of Benzonitrile to Benzamide .pdf (563.42 kB - downloaded 108 times.)
Mechanism of the base-catalyzed conversion of nitriles to amides.pdf (413.18 kB - downloaded 99 times.)

« *Last Edit: April 22, 2015, 07:17:58 AM by Uppy* »

Report to moderator Logged

pyrrolidin

Subordinate Wasp

Posts: 121

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #59 on:** April 22, 2015, 08:52:59 PM »

Quote from: ceramics on April 22, 2015, 08:33:09 PM

> Representative Procedure for Transformation of Aldehydes into Amides:
>
> A solution of appropriate aldehyde (5 mmol) and iodine (5.5 mmol) in ammonia water (30 mL of 28% solution) and THF (5 mL) was stirred at room temperature for 1 h. The dark solution became colorless at the end of reaction. Aqueous H2O2 (3 mL of 35% solution) was then added dropwise. The reaction mixture was stirred for 2-4 h and extracted with CH2Cl2. The organic phase was washed with brine, dried (Na2- SO4), and concentrated in vacuo. The residue was rinsed with hexane/EtOAc (1:3) to give a pure amide product (81- 98% yields).

Nice find. This could be a game changer, since ammonia and iodine are very basic chemicals and I bet the THF can be substituted some other water-miscible co-solvent like dioxane (don't use acetone for obvious reasons). I will try this soon and report back.
I attached the paper for everyone to read.

shie2003.pdf (50.33 kB - downloaded 122 times.)

Report to moderator Logged

Impossible

Founding Wasp

Posts: 631

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #60 on:** April 22, 2015, 09:25:31 PM »

Is the iodine recoverable? Atomic mass of iodine is about 2/3 the molar mass of the most popular aldehyde.
A 30g run requiring 20g of iodine will probably end up being more difficult than previous methods if the I2 cannot be reused.

Report to moderator Logged

pyrrolidin

Subordinate Wasp

Posts: 121

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #61 on:** April 22, 2015, 09:33:58 PM »

Quote from: Impossible on April 22, 2015, 09:25:31 PM

> Is the iodine recoverable? Atomic mass of iodine is about 2/3 the molar mass of the most popular aldehyde.
> A 30g run requiring 20g of iodine will probably end up being more difficult than previous methods if the I2 cannot be reused.

Iodine could be reoxidised by an equimolar amount of H2O2 after the run, I think. You could then add substrate and (if needed) fresh ammonia and run the reaction in the same solution again.
This is a possibility not a necessity. We will see wether this comes into play.

Report to moderator Logged

Scarecrow

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES

Quote

Dominant Wasp

Posts: 430

INTO AMIDES results
« **Reply #62 on:** April 23, 2015, 09:18:16 AM
»

Upon further reflection I believe that i added to much NaOH which may have been causing decomposition of the h2o2 before it could convert the intermediate nitrile. I think next time i will add base until ph 10.

Report to moderator Logged

It's a war on personal freedom, that's what it is.

Scarecrow
Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote
« **Reply #63 on:** April 23, 2015, 04:44:22 PM »

Aldehyde (90g, .468mol) was added to a solution of hydroxylamine hcl (32.52g, .468mol) in DMSO (900ml). The solution was heated for 60 minutes at 100*. Upon removal of the heat but while still hot, 10% hydroxide was added to the solution until the pH reached 8. The solution at this point was a clear browny orange colour. 500ml of 50% H2O2 was then added dropwise regularly checking the pH which was getting lower as the reaction continued. Small portions of 10% NaOH were continuously added to keep the pH at around 8. The temperature was kept at 55-60 the whole time, maintaining its own heat. Once the H2O2 addition was complete and the reaction came down to about 45 by itself, it was dumped in iced cold brine.

The first time I dumped my reaction in iced cold water it worked a treat, with lots of amide precipitating out. The last few times ive dumped it in about 10L of iced water, and as soon as the solution hits the iced water it goes a bright white, what I thought is precipitation. But everytime I leave it over with ice in it, leave it over night, then put it in the freezer and I just get a mix of goo and a white water. There is a strong amide smell, and the water looks oily, yet still no precipitate. Ive attatched a photo, I probably should have just solvent extracted to be safe but this should work.

55.jpg (4422.03 kB, 5312x2988 - viewed 290 times.)

Report to moderator Logged

It's a war on personal freedom, that's what it is.

Scarecrow
Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote
« **Reply #64 on:** April 23, 2015, 05:45:49 PM »

I left this in a bucket of ice water in the freezer, just decanted the top off and this is the liquid thats left. No amide. ;(So many hours of work with very little workable results..sucks.

My only conclusion now is that it must have to be done hot. Its only been since ive been doing this reaction at sub 70* temperatures that ive had this problem. I was running the H2O2 addition at 90* for 100g of amide and

although the reaction ran away to 110* for a bit, after cooling it down and dumping in ice water I still got 40g of amide.

These temps have never given me any good yeilds. Im out of aldehyde now ;(next time.... sigh.... il make sure I do this at higher temperatures

If you heat this water up the oil sinks to the bottom...

77.jpg (4692.39 kB, 5312x2988 - viewed 163 times.)

Report to moderator Logged

It's a war on personal freedom, that's what it is.

pyrrolidin

Subordinate Wasp

Posts: 121

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

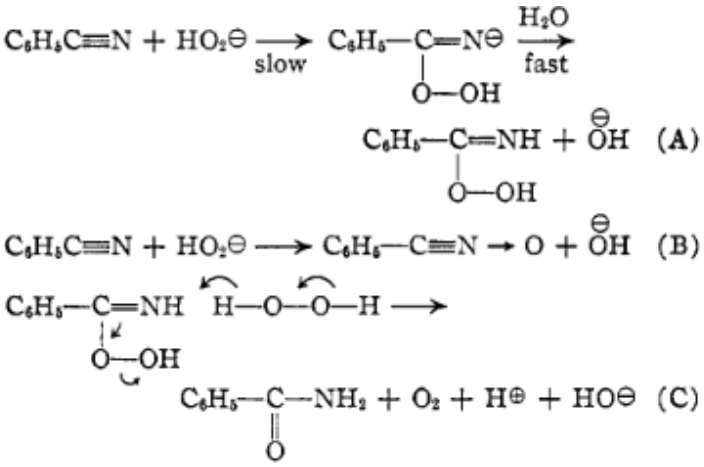
Quote

« **Reply #65 on:** April 23, 2015, 07:28:22 PM »

Quote from: ceramics on April 23, 2015, 03:19:21 PM

> I think that I just found why this is happening:
>
> "Low temperature protocols for the rearrangement of aldoximes were developed in methanol or water. As a representative example, the naphthalenediimine dialdoxime was almost quantitatively isomerized into the corresponding diamide at 60°C and with complete retention of the chirality, after 16 h."
>
> When I started the One-Pot conversion, I used Hydroxylamine.HCl instead of Hydroxilamine. If using Hydroxylamine.HCl, first the aldoxime is forming, and then, adding the NaOH solution the aldoxime will migrate into NaOH, destroying the further conversion. Please correct me if I'm wrong. I'm just speculating now, in front of my running reaction (sorry that I cannot post photos).
>
> So, since it already equilibrate itself @ around 60°C just like the patent stated think that I will wait and see after 16 h if the amide has formed, without adding no NaOH. I would love to see some results even if the ratio will be low.
>
> I will report results.

No, you need the HCl from the Hydroxylamine.HCl to activate DMSO to act as a deprotonating agent in the step forming the nitrile. You further need OH- ions in the next step because of the mechanism of the oxidation with hydrogen peroxide.



However:

Quote from: Scarecrow on April 23, 2015, 09:18:16 AM

> Upon further reflection I believe that i added to much NaOH which may have been causing decomposition of the h2o2 before it could convert the intermediate nitrile. I think next time i will add base until ph 10.

You can use Sodium carbonate or Potassium carbonate as base instead. In the original work by Wiberg they used these bases and avoided the problem of too high pH. Can you run a 5g run with K2CO3 and RT reaction temp. please?

« Last Edit: April 23, 2015, 07:33:58 PM by pyrrolidin » Report to moderator Logged

pyrrolidin
Subordinate Wasp

Posts: 121

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote

« **Reply #66 on:** April 23, 2015, 07:31:11 PM »

Quote from: Scarecrow on April 23, 2015, 05:45:49 PM

> I left this in a bucket of ice water in the freezer, just decanted the top off and this is the liquid thats left. No amide. ;(So many hours of work with very little workable results..sucks.
>
> My only conclusion now is that it must have to be done hot. Its only been since ive been doing this reaction at sub 70* temperatures that ive had this problem. I was running the H2O2 addition at 90* for 100g of amide and although the reaction ran away to 110* for a bit, after cooling it down and dumping in ice water I still got 40g of amide.
>
> These temps have never given me any good yeilds. Im out of aldehyde now ;(next time.... sigh.... il make sure I do this at higher temperatures
>
> If you heat this water up the oil sinks to the bottom...

you should definitely extract the aqueous phase next time with DCM and check the balance. Gotta get 100g more or less back or something water soluble has formed. I think you have amide but it's in your aqueous phase.

Report to moderator Logged

pyrrolidin
Subordinate Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote

« **Reply #67 on:** April 23, 2015, 08:16:59 PM »

I don't really wanna work with hydroxylamine freebase at high temperatures. Just a personal safety issue I wish to avoid. The DMSO route also doesnt require 48h reaction time but this procedure is nonetheless valuable and much

Posts: 121

better than the other amide conversions posted here (except the DMSO one)

Report to moderator Logged

Uppy

Larvae

Posts: 37

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #68 on:** April 23, 2015, 08:47:56 PM »

Pyrrolidin, would the same amount of Na2CO3 solution be used in place of NaOH?

-could sodium bicarbonate be useful to basify where it has the -OH?

« *Last Edit: April 23, 2015, 09:24:52 PM by Uppy* »

Report to moderator Logged

pyrrolidin

Subordinate Wasp

Posts: 121

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #69 on:** April 23, 2015, 08:53:34 PM »

Quote from: Uppy on April 23, 2015, 08:47:56 PM

> Pyrrolidin, would the same amount of Na2CO3 solution be used in place of NaOH?

Actually they only use 0.3 equivalents, but I would use 1.3 just to be sure. Shouldn't hurt since it won't elevate the pH the same way NaOH does.
If the proposed mechanism is right, we wouldn't need stochiometric amounts because OH- gets replenished by the reaction itself and can deprotonate another hydrogen peroxide molecule, but I would still try it both ways.

« *Last Edit: April 23, 2015, 09:00:10 PM by pyrrolidin* »

Report to moderator Logged

Uppy

Larvae

Posts: 37

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #70 on:** April 24, 2015, 04:08:33 AM »

From the Hoffman thread:

Quote from: Burgi-Dunit-Again on April 24, 2015, 01:05:41 AM

> I know this topic is about the hofmann rearrangement, but since everyone here seems to love theory, what really needs to be done to get this 'propanal of the ocean' scheduled as soon as possible is the following:
>
> Find a way to use TCCA / DCCA to get directly from the aldehyde to the nitrile: *Veisi, Hojat. "Direct oxidative conversion of alcohols, amines, aldehydes, and benzyl halides into the corresponding nitriles with trichloroisocyanuric acid in aqueous ammonia." Synthesis 15 (2010): 2631-2635.*
>
> The nitrile is then easily hydrolyzed to the amide in situ with a bit of H2O2, recrystallized from water, and the DCCA used again in the usual manner to form the amine.
>
> So there you have it. Two easy steps, two OTC reagents, and zero solvents..

I like how this reaction runs at only a little over RT, probably no need to add

base before hydrolysis if it's already basic? One would need at least an extraction solvent though but otherwise that looks really smooth.

Direct Oxidative Conversion of... Aldehydes... with Trichloroisocyanuric Acid in Aqueous Ammonia (115.46 kB - downloaded 149 times.)

« *Last Edit: April 24, 2015, 04:11:28 AM by Uppy* »

Report to moderator Logged

thewire

Dominant Wasp

Posts: 426

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #71 on:** April 25, 2015, 09:32:19 AM »

"Direct oxidative conversion of alcohols, amines, aldehydes, and benzyl halides into the corresponding nitriles with trichloroisocyanuric acid in aqueous ammonia." Synthesis 15 (2010): 2631-2635."

Great article! This lead to further research into conversation of nitriles to amides by hidrogen peroxide.

The Transformation of Nitriles into Amides Using Sodium Percarbonate
George W. Kabalka, Sunil M. Deshpande, Prakash P. Wadgaonkar & Narayana Chatla
pages 1445-1451

DOI:10.1080/00397919008052860

Roman Balicki & ?ukasz Kaczmarek (1993): Mild and Efficient Conversion of Nitriles to Amides with Basic Urea-Hydrogen Peroxide Adduct, Synthetic Communications: An International Journal for Rapid Communication of Synthetic Organic Chemistry, 23:22, 3149-3155

http://dx.doi.org/10.1080/00397919308011173

A Mild and Convenient Oxidation of Aryl Nitriles to Aryl Amides by Aqueous Sodium Perborate
Kathryn L. Reed, John T. Gupton & Traci L. Solarz
pages 563-571

THE TRANSFORMATION OF NITRILES INTO AMIDES BY HYDROGEN PEROXIDE.
L. McMaster , F. B. Langreck
J. Am. Chem. Soc., 1917, 39 (1), pp 103–109
DOI: 10.1021/ja02246a012

Efficient Hydrolysis of Nitriles to Amides with Hydroperoxide Anion in Aqueous Surfactant Solutions as Reaction Medium
Letters in Organic Chemistry, Volume 6, Number 2, March 2009, pp. 175-179(5)
Brinchi, Lucia; Chiavini, Lisa; Goracci, Laura; Di Profio, Pietro; Germani, Raimondo

---

00397919008244905 A Mild and Convenient Oxidation of Aryl Nitriles to Aryl Amides.pdf (281.32 kB - downloaded 69 times.)
00397919308011173Mild and Efficient Conversion of Nitriles to Amides with Basic Urea-Hydrogen Peroxide Adduct.pdf (226.85 kB - downloaded 60 times.)
00397919008052860 The Transformation of Nitriles into Amides Using.pdf (234.08 kB -

downloaded 93 times.)
ja02246a012.pdf (482.66 kB - downloaded 71 times.)
Letters in Organic Chemistry, 2009, 6, 175-179.pdf (80.26 kB - downloaded 73 times.)

« *Last Edit: April 25, 2015, 06:00:14 PM by thewire* »

Report to moderator Logged

Uppy
Larvae
Posts: 37

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #72 on:** April 30, 2015, 08:24:23 AM »

Quote

It's probably worth mentioning that apparently not only does TCCA react violently with ammonia, "Nitrogen trichloride, a highly explosive compound, may form if TCCA contacts ammonia, ammonia salts, urea, or similar nitrogen - containing compounds."

That sodium percarbonate paper looks promising material-wise, they seem to have trouble converting ortho-substituted aromatic nitriles, but shouldn't be a problem if (correct me if I'm wrong) it's the meta-substituted that we're working with?

thewire, I think we've been hunting the same grounds
http://www.sciencemadness.org/talk/viewthread.php?tid=25204

and one more for the horde!

Efficient Conversion of Nitriles to Amides with Basic Hydrogen Peroxide in Dimethyl Sulfoxide
Alan R. Katritzky* , Boguslaw Pilarski, Laszlo Urogdi
Synthesis 1989; 1989(12): 949-950
DOI: 10.1055/s-1989-27441

Nitriles 1 are efficiently transformed into N-unsubstituted amides 2 at 20°C in 5-30 mins in good yield and with high selectivity, using basic 30% hydrogen peroxide in dimethyl sulfoxide.

Efficient Conversion of Nitriles to Amides with Basic Hydrogen Peroxide in Dimethyl Sulfoxide (214.36 kB - downloaded 116 times.)

« *Last Edit: April 30, 2015, 08:53:02 AM by Uppy* »

Report to moderator Logged

Tatewari
Novice Alchemist
Larvae

Posts: 10

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #73 on:** May 02, 2015, 06:32:33 PM »

Quote

TANK YOU!!!!

Report to moderator Logged

A master of transmutation, the alchemist can alter nature at whim.

Kykeon
Subordinate Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #74 on:** May 03, 2015, 09:46:32 AM »

Posts: 178

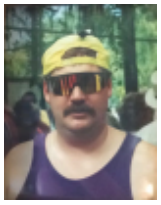
Good job ceramics!
I also attempted that reaction but it failed. I tried to do the oxidation in one pot.

Quite scary to add the TCCA I must say.

Report to moderator Logged

lullu

Dominant Wasp



Posts: 403

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #75 on:** May 03, 2015, 11:48:58 AM »

> **Quote from: ceramics on May 03, 2015, 08:46:07 AM**
>
> > **Quote from: Burgi-Dunit-Again on April 24, 2015, 01:05:41 AM**
> >
> > Find a way to use TCCA / DCCA to get directly from the aldehyde to the nitrile: *Veisi, Hojat. "Direct oxidative conversion of alcohols, amines, aldehydes, and benzyl halides into the corresponding nitriles with trichloroisocyanuric acid in aqueous ammonia." Synthesis 15 (2010): 2631-2635.*
> >
> > The nitrile is then easily hydrolyzed to the amide in situ with a bit of H2O2, recrystallized from water, and the xCCA used again in the usual manner to form the amine.

I can report that it works:

18g TCCA added very carefully to a mixture of 20g Aldehyde in 250ml aqueous NH3.

Warning: Use extreme caution when adding TCCA. You can add it in small portions over a period of time. It reacts violenty and it can explode. Do not try this at home!

After the reaction was complete, the mixture was quenched with H2O and extracted with Xylene. The combined organic layers were washed with brine and dried (MgSO4) to give 17g Nitrile. The dried Nitrile was hydrolyzed with H2O2. Final desired product: 15g Amide. Next time I will make small adjustments to the reaction for a better yield.

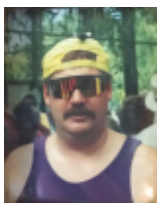
How high is the risk of forming NCl3 in the aqueous solution?

Report to moderator Logged

Just because you are not paranoid does not mean they are not after you.

lullu

Dominant Wasp



Posts: 403

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #76 on:** May 03, 2015, 04:04:34 PM »

Thanks.
Anyone measured the m.p of the nitrile?

Report to moderator Logged

Just because you are not paranoid does not mean they are not after you.

Uppy

Re: FACILE ONE-POT CONVERSION

Quote

Larvae

Posts: 37

OF ALDEHYDES INTO AMIDES results

« **Reply #77 on:** May 04, 2015, 12:10:56 AM »

Haha well I guess I'll save all that Hydroxylamine now but definitely, good job If my molar calculations serve me right, it looks like you just scaled up from the paper using 35% NH3 instead of 30%?

« *Last Edit: May 04, 2015, 02:48:27 AM by Uppy* »

Report to moderator Logged

Burgi-Dunit-Again

Subordinate Wasp

Posts: 176

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #78 on:** May 04, 2015, 05:14:51 AM »

Wow nice job, I'm glad to see that comment has actually materialized into something. These oxidative methods of forming nitrogen species seem to be fairly popular in the literature lately, as I have seen the same thing done with iodine.

If this actually works, then maybe I will finally get through all the aldehyde smelling up the place!

And Uppy: do save the hydroxylamine. It is a promising transamidation catalyst, which could be useful in other cases. Oxime formation is also the most reasonable way to get to primary amines from the corresponding carbonyls

« *Last Edit: May 04, 2015, 05:16:22 AM by Burgi-Dunit-Again* »

Report to moderator Logged

Uppy

Larvae

Posts: 37

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #79 on:** May 04, 2015, 07:00:14 AM »

Ahhh right on, had you used 250ml of 18.1M (35%) (4.52mols) you would have nailed it exactly! I believe that 800ml of 5.62M (10%) would have the same molar amount if anyone can confirm. Might help the reaction run a little cooler and less violent?

« *Last Edit: May 10, 2015, 05:01:08 AM by Uppy* »

Report to moderator Logged

Scarecrow

Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #80 on:** May 04, 2015, 07:13:22 PM »

Quote from: ceramics on May 03, 2015, 08:46:07 AM

Quote from: Burgi-Dunit-Again on April 24, 2015, 01:05:41 AM

Find a way to use TCCA / DCCA to get directly from the aldehyde to the nitrile: *Veisi, Hojat. "Direct oxidative conversion of alcohols, amines, aldehydes, and benzyl halides into the corresponding nitriles with trichloroisocyanuric acid in aqueous ammonia." Synthesis 15 (2010): 2631-2635.*

The nitrile is then easily hydrolyzed to the amide in situ with a bit of H2O2, recrystallized from water, and the xCCA used again in the usual manner to form the amine.

I can report that it works:

18g TCCA added very carefully to a mixture of 20g Aldehyde in 250ml aqueous NH3.

Warning: Use extreme caution when adding TCCA. You can add it in small portions over a period of time. It reacts violenty and it can explode. Do not try this at home!

After the reaction was complete, the mixture was quenched with H2O and extracted with Xylene. The combined organic layers were washed with brine and dried (MgSO4) to give 17g Nitrile. The dried Nitrile was hydrolyzed with H2O2. Final desired product: 15g Amide. Next time I will make small adjustments to the reaction for a better yield.

Weow! Great job man, cant wait to give this a go. How did you go about hydrolyzing your nitrile? In basic conditions drop by drop at what temp range? Was it very exothermic?

Report to moderator Logged

It's a war on personal freedom, that's what it is.

Scarecrow

Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #81 on:** May 05, 2015, 11:33:14 AM »

So just dissolve your nitrile in NaOH solution to around pH 8 and add H2O2?

Report to moderator Logged

It's a war on personal freedom, that's what it is.

Burgi-Dunit-Again

Subordinate Wasp

Posts: 176

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #82 on:** May 05, 2015, 05:39:08 PM »

IIRC the paper on formation of nitriles with iodine outlines a procedure for in-situ amide formation with h2o2. See: *Shie, Jiun-Jie, and Jim-Min Fang. "Direct conversion of aldehydes to amides, tetrazoles, and triazines in aqueous media by one-pot tandem reactions." The Journal of organic chemistry 68.3 (2003): 1158-1160.*

That being said, the peroxide mediated hydrolysis of nitriles is catalyzed by base, as it is dependent on formation of a peroxy anion. See: *McIsaac Jr, John E., R. E. Ball, and E. J. Behrman. "Mechanism of the base-catalyzed conversion of nitriles to amides by hydrogen peroxide." The Journal of Organic Chemistry 36.20 (1971): 3048-3050.*

You can certainly hydrolyze the nitrile in acidic conditions, but then addition of h2o2 would be fairly pointless.

Just thought I'd add: I doubt anyone will pursue the iodine based procedure given its cost and availability, but note that nitrogen triiodide is much less stable than the trichloride, and will detonate with even the most delicate brush of a feather.

« Last Edit: May 05, 2015, 06:06:49 PM by Burgi-Dunit-Again »

Report to moderator Logged

Uppy
Larvae
Posts: 37

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #83 on:** May 06, 2015, 01:02:02 AM »

Do you happen to have a full copy of that first paper? I had it at one point but all I can find now is iike the first page/abstract...

Report to moderator Logged

Burgi-Dunit-Again
Subordinate Wasp
Posts: 176

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #84 on:** May 08, 2015, 02:58:49 AM »

> **Quote from: Uppy on May 06, 2015, 01:02:02 AM**
>
> Do you happen to have a full copy of that first paper? I had it at one point but all I can find now is iike the first page/abstract...

Sorry Uppy but I agreed not to upload any journal articles I download, as my provider was worried it may implicate them somehow. Most broad-use journal subscriptions encode the time and date of the request in the pdf files when they are downloaded, and possibly more information but it's not really my area of expertise.

That being said, I really recommend you find a generous college student or pay one off for their login. Many decent-size universities give their students and employees access to an extensive range of academic journals. It is probably one of the best investments you can make in this hobby, especially with things like SciFinder out there.

Report to moderator Logged

Uppy
Larvae
Posts: 37

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #85 on:** May 08, 2015, 07:55:45 AM »

No worries Burgi, I received a copy, then I just realized it's the same one Ceramics mentioned and Pyrrolidin posted a few back anyways..

There are some good databases discussed in the reference section too, Vesp I believe had mentioned (booksc.org) which is awesome. Up to this paper, there wasn't one I couldn't find using it!

I really think this could be a realistic one-pot deal with aq. Nh3 and TCCA/H202. The acid would be neutralized with base, hydrolysis would proceed in the normal way from the literature.

Found another paper, another iodine catalyzed reaction, but the hydrolysis seems to be done without added base. It references a similar procedure also without added base. From what I've read, it's my understanding that nitriles can be hydrated to amides in either acid or base, but acid will push it past the amide, to the carboxylic acid?

One more paper I thought was interesting utilizes Manganese Oxide molecular sieves (OMS-2) as a catalyst in aq. Nh3, converting alcohols (and aldehydes as stated therein) directly to amides. I have no idea what these sieves are, but I wonder if manganese oxide could be used. It's easy enough to obtain if you're into... ceramics? although they do mention the physical structure of this

catalyst quite specifically so maybe that's a thing...

Sorry for the rambling, I still can't get out and dream yet so I hope you guys can deal with my armchair science.

Metal-free one-pot oxidative conversion of benzylic alcohols and benzylic halides into aromatic amides with molecular iodine ... aq ammonia... hydrogen peroxide .pdf (1371.04 kB - downloaded 69 times.)
Heterogeneously Catalyzed Synthesis of Primary Amides Directly from Primary Alcohols and Aqueous Amonia.pdf (355.93 kB - downloaded 73 times.)

Report to moderator Logged

P!ssedSc!ent!st
Subordinate Wasp
Posts: 100

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #86 on:** June 06, 2015, 10:03:33 AM »

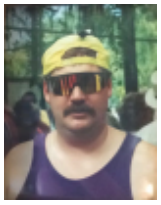
Um. At some point I believe Pyrollidin said when he ran that 10g batch of aldehyde and got such great yeilds and never saw any of that MSM crap he did it extra dilute - also washed something out with more h2o, so I think that extra not of water makes the difference after letting the DMSO be so hot for so long, the MSM has nowhere to go, but neither does the amide, but since the amide isn't soluble in water, it would be good to just start with a bit more water from the get go. OR, since someone mentioned the ratio of the h2o2 seeming way off, maybe more water in the h2o2 and slightly less h2o2 overall, maybe like 28% or something? There's no math in that, it's literally numbers pulled out of my ass. But do you think that would hurt?
I'm going to try this the next time I run that rxn.

And as for the h2o2 in aq ammonia - this may be a stupid question, but does that mean the exact same thing I would pour from a jug of dye-less cleaning ammonia at the hardware store?

Because if so, I have everything on hand to try that.
And I think I will also try that and report back after the confirmation of the ammonia thing

Report to moderator Logged

lullu
Dominant Wasp



Posts: 403

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #87 on:** June 17, 2015, 06:08:00 PM »

Quote from: P!ssedSc!ent!st on June 06, 2015, 10:03:33 AM

> And as for the h2o2 in aq ammonia - this may be a stupid question, but does that mean the exact same thing I would pour from a jug of dye-less cleaning ammonia at the hardware store?
>
> Because if so, I have everything on hand to try that.
> And I think I will also try that and report back after the confirmation of the ammonia thing

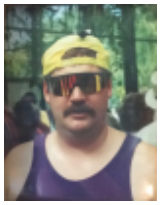
---

You mean TCCA in aq ammonia?
They use 30% (in the Synthesis 2010 paper) my guess would be that it will work if you adapt that and use the equivalent 25%? 20%?

Report to moderator Logged

Just because you are not paranoid does not mean they are not after you.

lullu
Dominant Wasp



Posts: 403

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #88 on:** June 17, 2015, 06:11:25 PM »

Okay what the fuck, 30% at 60°C don't they use fucking peer reviews at Synthesis? It is way over the solubility of NH3 in water at that temp.

Gotta love these publications from Iran/India.

« *Last Edit: June 17, 2015, 06:14:57 PM by lullu* »

Report to moderator Logged

Just because you are not paranoid does not mean they are not after you.

thewire
Dominant Wasp

Posts: 426

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #89 on:** June 17, 2015, 07:08:46 PM »

Quote from: lullu on June 17, 2015, 06:11:25 PM

> Okay what the fuck, 30% at 60°C don't they use fucking peer reviews at Synthesis? It is way over the solubility of NH3 in water at that temp.
>
> Gotta love these publications from Iran/India.

The mixture was stirred at r.t then at 60 C.
The author uses 45 molar excess NH3.

BTW it has been confirmed by someone here, it is a working procedure.

Report to moderator Logged

Burgi-Dunit-Again
Subordinate Wasp

Posts: 176

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

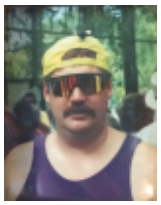
« **Reply #90 on:** June 17, 2015, 07:17:32 PM »

I will confirm as well with DCCA and ammonia. Reaction does go forward. Though, in my case, not quickly.

There are still better methods out there IMHO. At large scale this method will be quite dangerous and difficult to operate with large solvent volumes etc.

Report to moderator Logged

lullu
Dominant Wasp



Posts: 403

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #91 on:** June 18, 2015, 08:31:03 AM »

Quote from: thewire on June 17, 2015, 07:08:46 PM

> **Quote from: lullu on June 17, 2015, 06:11:25 PM**
>
> > Okay what the fuck, 30% at 60°C don't they use fucking peer reviews at Synthesis? It is way over the solubility of NH3 in water at that temp.

> Gotta love these publications from Iran/India.

> The mixture was stirred at r.t then at 60 C.
> The author uses 45 molar excess NH3.
>
> BTW it has been confirmed by someone here, it is a working procedure.

You are right I skimmed through it.
Btw I read a little bit about this reaction yesterday and the associated risks of the preparation.
NCl3 is stable in solutions up to 18%* (CCl4, CHCl3, benzol, hexane).
One would assume when doing this reaction that a lot of NCl3 is produced sinks to the botton where it could explode duo to the magstirrer?

*[Grauer Georg - Handbuch der Praparativen Anorganischen Chemie BAND 1, Seite 462]

« *Last Edit: June 18, 2015, 09:03:07 AM by lullu* »

Report to moderator Logged

Just because you are not paranoid does not mean they are not after you.

P!ssedSc!ent!st

Subordinate Wasp

Posts: 100

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #92 on:** July 29, 2015, 07:18:26 AM »

K. So, this is totally off the CURRENT topic, but still in the same vein as the thread should be.

Has anyone else been having a BITCH of a time recrystallizing the amide clean?? Like WHITE? It's been taking me fuhevuhhh to get that damn stank (the good sweet stank that tells you the rxn went well) and that yellow/orange out! Like having to dedicate entire DAYS just to purifying! And by then I had lost so much product from my terrible rextal skills the shit was pointless. I was getting back 23-27gs of RAW material back from a 20g aldehyde batch, that's before ANY purification, straight after evaping DCM. Seems good right? Well after 8 rextals and 3-4 vacuum washings w/cold h2o im left with fucking 3-5gs amide of STILL not my opinion of useable quality.

Well ladies and beeZ.

I figured it out. The secret is just h2o, then IPA/h2o, I had no luck with ethanol in this for whatever reason...

So to get fucking BLINDING.WHITE. powdered amide (can still rextallize if you want the prismatic shardy stars, but if you're going to powder them before the Hoffman, why bother?) Here's what you wanna do:

• powder or finely crush raw dirty amide.

• heat a flask of dH2O to boiling and pour, little by little, splashes of the boiling water into the crushed amide, swirling to distribute evenly. You only want to use about 1/3-1/2 the amides weight in boiling water, it will be a slush.

• once the solid has started to dissolve and is a slushy consistency, placed it on the heat as well, don't heat to boiling, just heat until it's a homogenous liquid. Some stirring will be needed. Should be kinda orange. A little bubbling doesn't hurt, but boiling is bad.

• if you have solids present, do a hot filtration by pouring some of that boiling water over a filter first, then pour the hot solution through.

• let sit covered until it is no longer warm to the touch, decant and filter the orangey/yellow liquid, wash the crystals with cold distilled water - not a fucking boatload - just a little at a time, maybe use a pipette like a gentleman. It'll solubilize in a BUNCH of water you fucking noob.

• should have sparkly, chunky yellowish amide now, about 1/3 less volume than you began with, depending on the purity you started with, after dried.

NOW, the important part:

• heat a flask with 1 part 70% IPA, 9-12 parts distilled water to boiling.

• add slowly, with a dropper the boiling solution to the finely re-crushed amide in a beaker until you attain that slushy consistency.

• place it on heating until you see the solid melt and on the bottom of the beaker there will be an orangey oil layer with a slightly milky top water layer.

• you must keep it hot enough that the top layer stays fairly clear, because there is so little water the amide will be precipitating in little bursts and swirls in it, if it's too cold, when you pippette this layer off, it'll crystallize and clog your pippette immediately.

• carefully siphon off the milky/cloudy top water layer from the oily orange goo at the bottom and quickly squirt this into a chilled shallow dish or beaker with a bit of cold distilled water in it. Colder the better.

• you'll need to add more cold water to the receiving vessel as you add the boiling water containing the amide/keep it in an ice bath Because when that hot hits that cold, clouds of sparkling bright goodness thicken up the water pretty fast and you don't want them to just re-solubize when you add the new hot water

• after you siphon off this water you'll be disappointed by the yield.
So, you repeat the water/IPA process - add more to the orange goo, heat, stir, and notice again how milky the top layer is and how the bottom layer seems darker orange - concentrating the garbage at the bottom and leaving beautiful amide solubilized in the hot water!

•• if the mix ends up homogenously orange and milky, you have too much IPA.

••just keep adding h2o/IPA soln, hear, stir, decant top layer until the pulls stop making the water cloud up when you squirt it into the cold.

•• the pippette is necessary because some orange shit floats on the top

FINALLY. clean amide for all!

Report to moderator Logged

AnyNameWillDo
Subordinate Wasp
Posts: 137

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #93 on:** July 29, 2015, 04:52:23 PM »

Nice, yeah trying to clean that stuff up with ethanol did fuck all. Been running the hofmann with dirty amide, stuff that looks like brown sugar/sand. Yields were good but cleaning it up like this will definitely help a lot. It just wasn't

even worth the effort trying to clean it up with ethanol.

« *Last Edit: July 30, 2015, 05:17:42 AM by AnyNameWillDo* »

Report to moderator
Logged

P!ssedSc!ent!st
Subordinate Wasp
Posts: 100

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #94 on:** July 30, 2015, 02:03:27 AM »

I dont have notes on me, but i really wanted to post some stuff that was vital to this reaction.

-cooling the NaOH solution every time and has almost completely prevented the need for an ice bath. if at all, cold water and like 3 ice cubes are GOOD.

-for a 20g aldehyde batch, the NH2OH should be 5.4 i believe?, well, using 5.5 has not hurt, in fact, the last 20g run put out 14g's. :]

-when adding the NaOH soln, adding it portionwise, like 10-20 ml @ a time over 8-14 minutes [these are estimations, takes me about 12 minutes to add 140ml] seems to be a little nicer to the reaction temp.

-the proposed 45min addition time for the h202 is pretty spot on, but the key here is, you WANT the reaction to be at at LEAST 60* nearly the whole addition, so pay close attention to it, because as soon as that motherfucker hits 70*, it gets to 90C in about 2 seconds and remember that "soyuz rocket" thing you prolly read a few pages back? yeah. THAT shit happens. lol if youll notice, the little yellow flakes only show up during the h202 addition if something is wrong, itll still yield, but youre cutting it down at least 10% if you see those flakes on top. if you add the h202 @ a temperature that is too low [honestly anything below 50*C is too low, 50* is OK, but seriously, try to maintain between 50-65] you want to see a little steaming from the rxn mix and some bubbles, that is the O2 forming. that evidently needs to happen to get the whole shebang to go down and turn the nitrile into the amide. the way i see it, the temp and your ability to keep it under control is the direct control to your yield at that point.

-i like to add the h202 with a pipette, because im a control freak. plus my addn funnel pisses me off. **side not: ive tried chilling the h202 to control temps, but this is how i learned that lower temps during the addition are the opposite of good.

-when everything is JUST right, youll have a VERY very pleasing smell. i cant even describe it yet as ive only smelled it never a few times. its maybe like a creamy, sweet, citrus...maybe THIS smell would be better termed "ocean somethingorother" because its fresh and divine. sadly, that smell is an impurity.

-there is another smell i wanted to note, of fucking ULTRAwonk garlic TAINT smell. occurs when you heat the water you vacuum washed the amide with to attempt to reduce it and force amide crstallization because you have no idea why suddenly your amide is cold water soluble on vacuum. long story short, dont fuck with a vacuum on this... maybe after you use my rextal method, but i still havent even tried the vac again after that 10g loss fiasco...that my...gerbil experienced when he was playing with my pots and pans after i TOLD his ass to cook DINNER.
fucking pets.
oh, i believe that smell is the result of some silly bullshit happening to the MSM and that nice smelling stuff heating up...blech..

-extract with DCM for good results. seriously, just like pyrrolidin, youll get 120% of what you put in after the DCM evaps. then you start that rextal process i outlined and you should have snow white goodness in a couple hours in 70-80% yields!

and seriously, i hope nobody gives me shit about these yields. because 80% is a real thing.
im not shitting you. 80% is a thing in the damn Hoffman too! I know a guy who has done BOTH. too bad it was two separate runs, lol.

« *Last Edit: July 30, 2015, 02:27:00 AM by P!ssedSc!ent!st* » Report to moderator Logged

unlikely_username
Subordinate Wasp
Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #95 on:** July 31, 2015, 04:40:31 PM »

Quote from: P!ssedSc!ent!st on July 30, 2015, 02:03:27 AM

> [...]
> and seriously, i hope nobody gives me shit about these yields. because 80% is a real thing.
> im not shitting you. 80% is a thing in the damn Hoffman too! I know a guy who has done BOTH. too bad it was two separate runs, lol.

I'm fairly certain I've received 80+% yields on a couple occasions for the amidation (if that's not a word, I'm making it one as of now).
I've received something in the 70-80% range from the hofmann, don't really remember, it was a while ago.
Both of these quite satisfactory yields were obtained within my first three attempts of the reaction.

These types of yields are very doable, the amidation has always been very high yielding for me when I haven't accidentally volcanoed my oxidation (careful with that H2O2 kids).
The hofmann is high yielding if you are patient and use high purity, very finely ground amide that is able to dissolve properly. Or maybe a cosolvent to solubilize everything better, still want to try that soon.

Report to moderator Logged

P!ssedSc!ent!st
Subordinate Wasp
Posts: 100

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #96 on:** July 31, 2015, 07:31:00 PM »

Quote from: unlikely_username on July 31, 2015, 04:40:31 PM

> **Quote from: P!ssedSc!ent!st on July 30, 2015, 02:03:27 AM**
>
> > [...]
> > and seriously, i hope nobody gives me shit about these yields. because 80% is a real thing.
> > im not shitting you. 80% is a thing in the damn Hoffman too! I know a guy who has done BOTH. too bad it was two separate runs, lol.
>
> I'm fairly certain I've received 80+% yields on a couple occasions for the amidation (if that's not a word, I'm making it one as of now).
> I've received something in the 70-80% range from the hofmann, don't really remember, it was a while ago.
> Both of these quite satisfactory yields were obtained within my first three attempts of the reaction.
>
> These types of yields are very doable, the amidation has always been very high yielding for

> me when I haven't accidentally volcanoed my oxidation (careful with that H2O2 kids).
> The hofmann is high yielding if you are patient and use high purity, very finely ground amide that is able to dissolve properly. Or maybe a cosolvent to solubilize everything better, still want to try that soon.

Yes, indeed. This is definitely a beautiful series of rxns and will be sure to see our honey banned in no time.
SO LET'S EXPLOIT THOSE MOLECULE BOYEEZ.

the co-solvent thing seems good, I also agree, if only for the easier dissolving of the amide lol finely powdered and very very pure seem to be the two key factors that I think everyone who is claiming "false writeup" are not looking at. Sandy amide ain't OK, tan, beautiful smelling amide ain't OK, long, slightly elastic rhombic 'amide' crystals - s'fuckin MSM.

Diligence and good lab technique.

Report to moderator Logged

AnyNameWillDo
Subordinate Wasp
Posts: 137

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #97 on:** July 31, 2015, 07:43:30 PM »

Lol you just used every description I've written here of the amide I've seen to describe what "ain't ok"... *hangs head in shame*

Haha! But that's actually good because it presents an obvious solution to the poor yields. Which was known previously as well, it's just that ethanol was worthless and there wasn't much other option. Now you've kindly given a glimmer of hope to cleaning it up.

Report to moderator Logged

AnyNameWillDo
Subordinate Wasp
Posts: 137

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #98 on:** August 07, 2015, 11:17:40 PM »

Why hasn't anyone talked about cleaning the amide with just straight acetone? Seems like it works.

Edit: It works... But it works like shit. A little bit came out white as snow but the rest of the acetone/amide just turns to light mud color and is a pain in the ass. I'm about sick of this amide!! I guess it's not the amides fault, I just can't purify it to save my life. Really getting annoyed with it/myself.

« *Last Edit: August 08, 2015, 12:04:37 AM by AnyNameWillDo* »

Report to moderator Logged

unlikely_username
Subordinate Wasp
Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #99 on:** August 09, 2015, 08:48:45 PM »

The amide is fairly soluble in acetone, washing with acetone usually just dissolves a lot of everything.

Report to moderator Logged

Scarecrow

Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #100 on:** August 10, 2015, 09:34:19 AM »

Dissolve amide in hot ethanol then dump in ice cold distilled water for white amide crystals. I think I recrystalized this in Xyelene once too and it worked fairly well

Report to moderator Logged

It's a war on personal freedom, that's what it is.

AnyNameWillDo

Subordinate Wasp

Posts: 137

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #101 on:** August 10, 2015, 03:41:56 PM »

This is actually what I tried first. However, I dissolved in hot IPA, since they don't even sell pure ethanol here and I'm out at the moment, and then dumped that into a small beaker of ice cold water. There was SOME really white amide that formed but a large portion of it just settled onto the bottom looking quite brown. Seemed like maybe 10-15%, at most came out as white amide that floated around the water, the rest just settled straight to the bottom and formed a dirty amide puck.

I don't see how it's possible to fuck something as simple as this up, but I'm just going to assume I'm the problem since its worked for you guys. Everything else has gone according to plan, minus poor hofmann yields, likely because of this impure amide. The final product is smooth and amazingly potent. But this amide, I don't know, I just can't seem to clean it up to save my life. Just going to keep trying until I figure out what the issue is. I'll try adding the boiling IPA/amide in smaller portions, making sure the water hasn't warmed too much before further additions. Might have been adding too much at once.

Report to moderator Logged

thewire

Dominant Wasp

Posts: 426

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #102 on:** August 10, 2015, 09:13:43 PM »

A rapid, convenient, solventless green approach for the synthesis of oximes using grindstone chemistry

Results

Carbonyl compounds (aliphatic, heterocyclic, and aromatic) were converted into the corresponding oximes in excellent yields by simply grinding the reactants at room temperature without using any solvent in the presence of Bi2O3. Most importantly, this method minimizes waste disposal problems, provides a simple yet efficient example of unconventional methodology and requires short time.

Organic and Medicinal Chemistry Letters 2011, 1:12 doi:10.1186/2191-2858-1-12
http://www.orgmedchemlett.com/content/1/1/12

5.1. Typical procedure for the formation of oxime 2

A mixture of aldehyde/ketone 1 (1 mmol), hydroxylamine hydrochloride (1.2 mmol), and Bi2O3 (0.6 mmol) was grounded in a mortar with a pestle for the required period of time. On completion of the reaction as monitored by TLC, ethyl acetate (2 × 10 mL) was added to the reaction mixture and filtered to separate the Bi2O3. The filtrate was concentrated down to approx. 6 mL, then added water to it when product precipitated out from the solution. The precipitate was filtered out and dried in high vacuum to furnish the pure oxime 2 in 60-98% yield.

Catalytic synthesis of amides via aldoximes rearrangement
Pascale Crochet* and Victorio Cadierno*

Chem.Commun.,
2015,51, 2495--2505 |2495
http://www.chtf.stuba.sk/~szolcsanyi/education/files/Organicka%20chemia%20II/

Transition metal-free synthesis of primary amides from aldehydes and hydroxylamine hydrochloride

Tetrahedron Letters
Volume 55, Issue 20, 14 May 2014, Pages 3192–3194

Wei Wang, Xue-Mei Zhao, Jing-Li Wang, Xin Geng, Jun-Fang Gong, Xin-Qi Hao, Mao-Ping Song

http://www.sciencedirect.com/science/article/pii/S0040403914006194

10.1016@j.tetlet.2014.04.020.pdf (3243.08 kB - downloaded 49 times.)

« *Last Edit: August 23, 2015, 08:10:59 PM by thewire* » Report to moderator Logged

thewire
Dominant Wasp
Posts: 426

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #103 on:** August 12, 2015, 05:38:32 PM »

Quote

MSM can be removed from the amide by cold water wash. Based on these solubility data:

"*Properties of Methyl Sulfonyl Methane*

MSM is easily soluble in water, water solubility: 10g in water at 5 °C, 16g in water at 10 °C, 37g in water at 30 °C, 120g in water at 60 °C , 250g in water at 95 °C 250. Solubility in methanol: 1g at -10 °C, 3.5g at 0 °C, 20g at 30 °C 20, 34g at 60 °C 34 . It is also easily soluble in ethanol, acetone, slightly soluble in toluene, chloroform. MSM aqueous solution is neutral. "

http://www.bf-msm.com/cgi/search-en.cgi?f=contact_en+product_en1+product_en+&t=product_en&cate2=xinzhi

Report to moderator Logged

d00d

Founding Wasp

Posts: 719

Forum Moron

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #104 on:** August 19, 2015, 11:42:11 AM »

Hmmm.... I may be wrong but, why not just bubble an equimolar amount of anhydrous NH3 through the aldehyde to form an intermediary then heat said compound to decompose to amide?

Don't make me dig up the 19th century paper, its way too 'facile', might piss some people off... unless the chloriation makes the amide in question so special....

IMHO your not a man unless you've had a facefull of anhydrous NH3 at least once in your life.... what doesn't kill you will surely make your second pair of balls drop. It just stings a bit, suck it up, wash it off, your one of "us" now.... j/k lol

« *Last Edit: August 19, 2015, 11:44:37 AM by d00d00d00* » Report to moderator Logged

Greater knowledge through stupidity

Scarecrow

Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #105 on:** August 19, 2015, 12:27:45 PM »

Could you provide some more detail please?

Report to moderator Logged

It's a war on personal freedom, that's what it is.

d00d

Founding Wasp

Posts: 719

Forum Moron

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #106 on:** August 20, 2015, 02:17:41 AM »

More detail? I'll pm you the link to the paper, I don't want to drop any bombs, my name isn't funkmaster flex.

Report to moderator Logged

Greater knowledge through stupidity

Burgi-Dunit-Again

Subordinate Wasp

Posts: 176

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #107 on:** August 21, 2015, 04:07:35 AM »

Heating imines gives amides now? Perhaps in the presence of some oxidant, the two are in differing oxidation states..

You could oxidize to the carboxylic acid in a number of ways, then perhaps

form an ester and heat with ammonia to give the amide. Good luck keeping the methylenedioxy intact though.

Report to moderator Logged

d00d

Founding Wasp

Posts: 719

Forum Moron

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #108 on:** August 21, 2015, 06:12:36 AM »

Sry, I was blacking out from a cloudy smorgasbord of airborne 'VOC's' ... disregard my previous post, I am a high functioning retard.

Wait... maybe not so retarded...

http://www.sciencemadness.org/talk/viewthread.php?tid=19211

« *Last Edit: August 21, 2015, 09:23:05 AM by d00d00d00* » Report to moderator Logged

Greater knowledge through stupidity

CHEMICALCOWBOY36

Subordinate Wasp

Posts: 222

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #109 on:** August 22, 2015, 01:37:49 AM »

Idk if it will work doesnt heat break down the 3 4 methylenedioxy ring ?

Report to moderator Logged

In this, you must never lapse. Even those who would be our allies would not understand. Our domain is the shadow. Stray from it reluctantly, for when you do, you must strike hard ,fast and fade away... Without a trace.

eventhorizon

Larvae

Posts: 17

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #110 on:** August 22, 2015, 01:52:36 AM »

@TCdboy28 so what are distillations ?

Report to moderator Logged

Burgi-Dunit-Again

Subordinate Wasp

Posts: 176

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #111 on:** August 22, 2015, 08:33:37 AM »

Direct amidation of carboxylic acids requires very high temperatures without a catalyst. It would be hard to keep the ammonia in solution for such a reaction unless you had a pressurized vessel, in which case it would be a pretty dangerous operation.

People form benzamide from benzoic acid using urea, presumably for fentanyl synthesis. I believe there's a post on SM about this being catalyzed by boric acid and some other things, but it's a different mechanism from amidation with ammonia. My guess is the boric acid catalyst would also catalyze

destruction of the methylenedioxy at the high temps required.

In distillation there is nothing besides your compound. Amidation requires some general acid or general base catalysis to achieve reasonable rates which is problematic for sensitive substrates..

Report to moderator Logged

atara
Founding Wasp
Posts: 2,257

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #112 on:** August 23, 2015, 07:02:49 PM »

Quote

In reference to the Bi2O3 ball-mill oximation, bismuth can be obtained from the famous antidiarrheal Pepto-Bismol or equivalent, which is bismuth subsalicylate. Simply burning the bismuth subsalicylate and calcining the resulting ash should yield Bi2O3, bismuth's only stable oxide.

If 50% molar equivalent is really necessary though then I hope you can easily regenerate the catalyst -- it seems like

RCHO + NH2OH + 2/3Bi2O3 >> RCHNOH + 2/3Bi(OH)3
Bi(OH)3 + heat >> Bi2O3 + 3/2H2O

One reason to prepare the oxime separately is that excluding water during the Beckmann rearrangement prevents the hydrolytic side-reaction (both oxime and amide are susceptible to hydrolysis), which should raise yields. One-pot does *not* mean higher yield; in many cases, the opposite.

Report to moderator Logged

critmass235
Larvae
Posts: 44

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #113 on:** August 26, 2015, 10:51:50 PM »

Quote

Bi2O3 is used in crackle fireworks as a replacement for lead

Report to moderator Logged

d00d
Founding Wasp

Posts: 719
Forum Moron

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #114 on:** September 05, 2015, 06:31:27 PM »

Quote

So DCCA/30% aq NH3 to form the nitrile then nitrile to amide via H2O2? Confirmed? Any tips? Is TCCA superior as they are both sitting right next to each other at ye olde shoppes.

Sounds like a party! Any self-harm prevention, hazard mitigation tips?

Will excess H2O harm the forming of the nitrile? If not, household nh3 could be used if scaled in an equimolar fashion.
Hydroxylamine sounds tedious and dangerous, as does DMSO with its skin-permeating properties. Just reading descriptions of the hazards is enough to worry Dr.Zaius.

Report to moderator Logged

Greater knowledge through stupidity

ceramics
Larvae
Posts: 14

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #115 on:** September 07, 2015, 11:23:10 AM »

Quote

Dr. Zaius, search for **Reply #74/#75/#77/#79** my *loose lips* already reported that it works... Be careful when adding the TCCA, no more than a tip of spoon per addition...

Report to moderator Logged

d00d
Founding Wasp

Posts: 719
Forum Moron

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #116 on:** September 07, 2015, 11:47:43 AM »

Quote

Not there, only Uppys posts.

I was talking about DCCA, in other words I was asking Burghi, not you. You already know I think you are a moron, but lets not get into that now.

« *Last Edit: September 07, 2015, 11:55:20 AM by d00d00d00* »

Report to moderator Logged

Greater knowledge through stupidity

ceramics
Larvae
Posts: 14

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #117 on:** September 07, 2015, 12:10:50 PM »

Quote

well... read more careful between those lines... love you too brother months ahead other discussed methods, even the award-winning mdpxx... but I will not post them anymore...

« *Last Edit: September 07, 2015, 12:36:26 PM by ceramics* »

Report to moderator Logged

d00d
Founding Wasp

Posts: 719
Forum Moron

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #118 on:** September 08, 2015, 11:53:23 PM »

Quote

The doctor thinks the nitrile (or other intermediary) can be formed by bubbling anhydrous NH3 through the aldehyde followed by decomposition (either heat or h2o2 hydrolysis) to the amide. It is how formamide is made industrially, IIRC.

Wait, thats formic acid --> formamide not formaldehyde ---> formamide. My fault....

Just throwing this out there but couldn't the carboxylic acid of our aldehyde be

formed, then the intermediate (h-formate) via anhydrous NH3, followed by thermal decomposition to the amide? Could be a better route as far as safety/scaling up is concerned. It would be incredibly facile depending on what it takes to form the carboxylic acid, if that is even possible.

Wait - this could be very possible and very facile

http://www.organic-chemistry.org/synthesis/C1O/carboxylicacids/oxidations.shtm

Quote

> Sodium perborate in acetic acid is an effective reagent for the oxidation of aromatic aldehydes to carboxylic acids, iodoarenes to (diacetoxyiodo)arenes, azines to N-oxides, and various sulphur heterocycles to S,S-dioxides. Nitriles undergo smooth oxidative hydration to amides when aqueous methanol is employed as solvent.
> A. McKillop, D. Kemp, Tetrahedron, 1989, 45, 3299-3306.

Whoa... wait a second.... this sounds very interesting, a procedure that fits! The doctor requests a pull on this paper, once he reads it, he will try this procedure using our aromatic aldehyde.

ceramics;
Your posts aren't there. There are no lines to read in between. No worries, like I said, I wouldn't follow your procedure if it wasn't verified by Burgi anyway.

Edit;
Found the paper, here.
http://jsforum.chez-alice.fr/syn/t1989-3299.pdf

Now, the issue is whether or not our aldehyde is an electron withdrawing or electron donating substituent. This is far beyond the doctor's level of expertise. Dr.Zaius is asking his fellow primates for help in this respect. Thanks...

« *Last Edit: September 09, 2015, 02:55:49 AM by d00d00d00* »

Report to moderator Logged

Greater knowledge through stupidity

Zippy
Founding Wasp
Posts: 542

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #119 on:** September 09, 2015, 04:25:45 AM »

This isn't what they mean by an aromatic aldehyde. They mean the aldehyde is attached directly to an aromatic ring.

Report to moderator Logged

ceramics
Larvae
Posts: 14

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #120 on:** September 09, 2015, 11:01:21 AM »

Quote from: ceramics on May 03, 2015, 08:46:07 AM

> I can report that it works:
>
> 18g TCCA added very carefully to a mixture of 20g Aldehyde in 250ml aqueous NH3.
>
> **Warning: Use extreme caution when adding TCCA. You can add it in small portions**

over a period of time. It reacts violenty and it can explode. Do not try this at home!

After the reaction was complete, the mixture was quenched with H2O and extracted with Xylene. The combined organic layers were washed with brine and dried (MgSO4) to give 17g Nitrile. The dried Nitrile was hydrolyzed with H2O2. Final desired product: 15g Amide. Next time I will make small adjustments to the reaction for a better yield.

Zaius, this was the original post... got deleted... but it works. Take extra care with NH3, mask and fume hood ventilation is a must!

Report to moderator Logged

---

d00d

Founding Wasp

Posts: 719

Forum Moron

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #121 on:** September 09, 2015, 03:54:49 PM »

Quote from: Zippy on September 09, 2015, 04:25:45 AM

> This isn't what they mean by an aromatic aldehyde. They mean the aldehyde is attached directly to an aromatic ring.

My fault, but there are ways to oxidize to the Carboxylic acid which might save the dangerous TCCA/Ammonia step.

http://www.organic-chemistry.org/abstracts/literature/565.shtm

It is also fairly facile and uses readily available reagents. It claims also to be very 'mild' which, knowing the fragility of the methylene-dioxy ring is a good thing.

https://en.wikipedia.org/wiki/Potassium_peroxymonosulfate

Report to moderator Logged

Greater knowledge through stupidity

Zippy

Founding Wasp

Posts: 542

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #122 on:** September 09, 2015, 04:27:25 PM »

Quote from: d00d00d00 on September 09, 2015, 03:54:49 PM

> **Quote from: Zippy on September 09, 2015, 04:25:45 AM**
>
> > This isn't what they mean by an aromatic aldehyde. They mean the aldehyde is attached directly to an aromatic ring.
>
> My fault, but there are ways to oxidize to the Carboxylic acid which might save the dangerous TCCA/Ammonia step.
>
> http://www.organic-chemistry.org/abstracts/literature/565.shtm
>
> It is also fairly facile and uses readily available reagents. It claims also to be very 'mild' which, knowing the fragility of the methylene-dioxy ring is a good thing.
>
> https://en.wikipedia.org/wiki/Potassium_peroxymonosulfate

That is actually rather interesting. Doing the reaction in IPA would yield the

ester, which would make conversion to the amide much easier with ammonia.

Report to moderator Logged

unlikely_username

Subordinate Wasp

Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #123 on:** September 11, 2015, 03:54:52 PM »

I'm just gonna drop by here and say that I've had good results with optimizing the one pot DMSO conversion.
The amount of DMSO in the writeups here is excessive, a ratio of 5:1 dmso:aldehyde (v/w) is sufficient for both nitrile formation and oxidation, I haven't gone lower but it's a possibility. Some methanol/ethanol is often required to increase solubility of the nitrile during the oxidation due to the addition of water.
The amount of h2o2 can be reduced significantly, a friend of mine recently reported good yields with 60ml 29% h2o2 per 10g aldehyde. It is our belief that this can be further reduced.
The pH must be controlled, I've found a bicarbonate buffer system to work acceptably if you adjust pH as you add peroxide, pH 8-11 is the range I try keep it in, if I had a ph meter I'd aim for 10. The pH of commercial peroxide solutions is usually ~5 and this can kill your reaction if you don't account for it.
The workup is extremely straightforward. Strip off any alcohols and let it sit. Either at rt or in a fridge. Product precipitates if you've reduced the dmso and have enough water in there. Adding a bit of extra water and/or leaving it in the fridge for a day or two tends to drop any last bits out of solution.
Temperature is important during both steps. Do not allow the nitrile formation to overheat. There is some kind of transient exothermia once you hit 80C or so, be prepared to cool it. If you hit 130C there's a good chance you cooked it. Yield will be reduced.
The oxidation is picky, it really doesn't like to initiate much below about 60C and proper pH, and if you've added all your peroxide and everything starts to react at once all of the sudden you're at 80C and rising (yes I've had occasional problems with methanol suddenly evaporating all at once, not fun). Once the solution changes from orange to yellow you're almost done, I usually let it stir for another hour or two as the peroxide finishes reacting/decomposing. I recommend adding some edta to try to help sequester metal ions that can catalyze decomposition, but this is optional.

This isn't exactly a write-up, but I thought people would appreciate the information nonetheless.
This is a result of the combined efforts of myself and another individual to address some of the less favourable aspects of this reaction. We're obviously not finished but it's progress.

Report to moderator Logged

CHEMICALCOWBOY36

Subordinate Wasp

Posts: 222

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #124 on:** September 11, 2015, 05:01:44 PM »

Great to hear fellow bee i was wondering if 29% h202 would work ! Im glad other bees are still working on optimizeing this synthesis!

Report to moderator Logged

In this, you must never lapse. Even those who would be our allies would not understand. Our

domain is the shadow. Stray from it reluctantly, for when you do, you must strike hard ,fast and fade away... Without a trace.

d00d

Founding Wasp

Posts: 719

Forum Moron

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #125 on:** September 12, 2015, 10:43:01 PM »

The doctor attempted the aqueous nh3 -> nitrile variant.

Upon addition of the aldehyde to the aqueous nh3 and stirring via magnetic stirring the solution went pink? The solution was stirred continuously while TCCA was added very slowly. Color changes went from orange, to brown, then a precipitate (brown salt) began to float to the top near the end of the prescribed TCCA amount.

The vessel was then refrigerated and put aside, the reaction seemed to continue and a mass of brown precipitate has floated to the top, extraction with an alkene solvent will come next. Any reason why the h202 hydrolysis cannot be done in the same vessel without extraction of the nitrile?

The doctor will be preparing for a peroxymonosulfate -> carboxylic acid procedure. He has came down with some sort of sickness and is not operating at full mental capacity.

« *Last Edit: September 12, 2015, 10:45:38 PM by d00d00d00* »

Report to moderator

Logged

Greater knowledge through stupidity

unlikely_username

Subordinate Wasp

Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #126 on:** September 12, 2015, 11:44:07 PM »

Quote from: d00d00d00 on September 12, 2015, 10:43:01 PM

> The doctor attempted the aqueous nh3 -> nitrile variant.
>
> Upon addition of the aldehyde to the aqueous nh3 and stirring via magnetic stirring the solution went pink? The solution was stirred continuously while TCCA was added very slowly. Color changes went from orange, to brown, then a precipitate (brown salt) began to float to the top near the end of the prescribed TCCA amount.
>
> The vessel was then refrigerated and put aside, the reaction seemed to continue and a mass of brown precipitate has floated to the top, extraction with an alkene solvent will come next. Any reason why the h202 hydrolysis cannot be done in the same vessel without extraction of the nitrile?
>
> The doctor will be preparing for a peroxymonosulfate -> carboxylic acid procedure. He has came down with some sort of sickness and is not operating at full mental capacity.

Any residual chlorine will violently decompose the peroxide.

Report to moderator Logged

d00d

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES

Quote

Founding Wasp

Posts: 719

Forum Moron

INTO AMIDES results
« **Reply #127 on:** September 13, 2015, 06:49:03 AM »

> **Quote from: unlikely_username on September 12, 2015, 11:44:07 PM**
>
> > **Quote from: d00d00d00 on September 12, 2015, 10:43:01 PM**
> >
> > The doctor attempted the aqueous nh3 -> nitrile variant.
> >
> > Upon addition of the aldehyde to the aqueous nh3 and stirring via magnetic stirring the solution went pink? The solution was stirred continuously while TCCA was added very slowly. Color changes went from orange, to brown, then a precipitate (brown salt) began to float to the top near the end of the prescribed TCCA amount.
> >
> > The vessel was then refrigerated and put aside, the reaction seemed to continue and a mass of brown precipitate has floated to the top, extraction with an alkene solvent will come next. Any reason why the h202 hydrolysis cannot be done in the same vessel without extraction of the nitrile?
> >
> > The doctor will be preparing for a peroxymonosulfate -> carboxylic acid procedure. He has came down with some sort of sickness and is not operating at full mental capacity.
>
> Any residual chlorine will violently decompose the peroxide.

IDK, h2o2 is used to decompose chlorine in pools etc, lots of 'safe' uses.

When performing the nh3/tcca variant, the doctor noticed a large amount of 'brown sugar' looking solid when forming the nitrile. Is this the feared NCl3? Or is this his nitrile?

Hmm... he thinks that the nitrile does not need to be isolated and dried prior to oxidation with H2O2/NaOH when performing the NH3/TCCA variant. Just basify to 8-9+ then add H2O2 dropwise while heating lightly to 60C. There is no worry of violent decomposition of excess chlorine as it is reasonably mild and the NaOH addition took care of that.

« *Last Edit: September 13, 2015, 07:02:49 PM by d00d00d00* »

Report to moderator Logged

Greater knowledge through stupidity

Scarecrow

Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #128 on:** September 13, 2015, 07:27:11 PM »

Quote

Does anyone know if its possible to vacuum distill this amide? There seems to be a lot of trouble with purification, distillation would be a nice easy way to go about it if the bp isnt too high.

Report to moderator Logged

It's a war on personal freedom, that's what it is.

Kykeon

Subordinate Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #129 on:** September 13, 2015, 07:37:22 PM »

Quote

Posts: 178

The purification isnt troublesome at all if you allow the amide to precipitate over night in the freezer opposed to extracting it.

The precipitated amide is so much cleaner and after an recrystallization in ethanol it will look real beautiful.

Ive mentioned this earlier but perhaps it got lost in the flood of posts regarding this preparation.

Report to moderator Logged

Flasky Mountain Flask

Pupae

Posts: 70

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #130 on:** September 13, 2015, 09:21:57 PM »

DCM has worked surprisingly well to re-x the amide.

A certain surgical bee has run the DMSO reaction posted in the OP twice. The first time, no special optimizations were implemented except that less DMSO and less hydroxylamine HCl was used than in the "FACILE" paper, as per the OP's optimizations. aldehyde-->nitrile was done at 80*C for about 90m, then reaction mix was cooled to 10*C for the addition of base and peroxide. Extracted with DCM. DCM was then water-washed, causing a horrible emulsion (live and learn) - should have figured this would happen due to amide's affinity for water, but didn't want to do without the wash because of MSM being mentioned as a water-soluble byproduct. Landed on 6g gooey yellow "amide".

Re-x with DCM was pretty straightforward, simply add some DCM to a flask containing your impure amide, heat the flask until full dissolution, then slowly cool to form slushy-looking precipitates. Filter the precipitates and allow to completely dry, then repeat the process once. Yielded 3.2g sparkling white bone-dry amide within 1 hour of completing the reaction.

The second time running this was optimized as per unlikely-username. For 10g aldehyde, 3.9g hydroxylamine hydrochloride and 70ml DMSO were used. Also, addition of base and peroxide was not done blindly at cold temps but with pH monitoring and between 30-60*C with an ice bath on hand to cool it back down once the temps reached 60. The yield from this reaction (after extraction and re-x) was 9.4g sparkling white amide (re-x from DCM).

It was found that at 30*C, you can add about 3ml of 30% peroxide at once without raising the temp above 35*C. The 4th ml in under 20 seconds raises the temp to about 42 and the 5th ml raises the temp to 55*c. So basically adding this amount at once (not something that happened early in the reaction but it eventually came to this) then stirring until the reaction again became clear was very helpful. Also, the addition of ethanol to the mix became obviously necessary (due to reduced DMSO levels) once about 1/4 of the peroxide was added and a fat precipitate formed. Once the frothing and foaming was done, if the temp was down to 50*, another ml peroxide could be added, the exotherm would bring it up to about 62, frothing would settle, then reaction would be submerged in an ice bath until it was at around 30*C again.

Hoffman yields from the 3.2g amide were passable (660mg HCl salt, a whopping 6% yield on the aldehyde, but a 20% yield of amine from amide) but could stand some optimizations.

Also, anyone else notice that the amide actually has a kind of safrole smell

which is not present in any other intermediates in this reaction?

« *Last Edit: September 13, 2015, 09:24:37 PM by lysurgeon* »

Report to moderator

Logged

P!ssedSc!ent!st

Subordinate Wasp

Posts: 100

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #131 on:** September 14, 2015, 09:05:18 PM »

I DID notice that beautiful smell before the amide is clean. But I don't smell safrole, I smell what I assume is something closer to mdp2p, however I've never smelled it before - i have smelled safrole, which is where I base my nasal opinion here.

-side note: stirred aldehyde+oxone in meoh for 6 hours and left sitting no stir for 8 days, upon return there is a darker orange oil floating on top of the bottom layer of helional colored oil.
Haven't done anything further, but maybe confirmation of ozone for use in oxidizing to carboxylic acids.

And holy HELL. That optimization seems badASS. But how much of what % h2o2 did you use? I usually keep my h2o2 chilled to prevent decomp, so addition while cold seems to be a good idea. Will have someone try it asap and report back.

Report to moderator Logged

CHEMICALCOWBOY36

Subordinate Wasp

Posts: 222

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #132 on:** September 14, 2015, 11:24:47 PM »

There is an easier route to the carboxylic acid!
ill post it after i get off work i got check my library

Report to moderator Logged

In this, you must never lapse. Even those who would be our allies would not understand. Our domain is the shadow. Stray from it reluctantly, for when you do, you must strike hard ,fast and fade away... Without a trace.

Flasky Mountain Flask

Pupae

Posts: 70

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #133 on:** September 16, 2015, 02:09:36 AM »

Maybe that is what it is, an MDP2P contamination. Not entirely far-fetched since oxidative processes are used to generate the corresponding carbonyls and acids from amines. Which (side note) is a process I'll be looking into. Apparently simply heating a primary amine hydrochloride in DMSO at 170*C for 20 hours generates the carbonyl compound in decent yield along with a mixture of methylated primary amines. (Methods for the Oxidation of Organic Compounds, Haines 1988).

Also not a huge bummer, but I was a little spaced when I weighed out the amide and hadn't allowed it to fully dry out before putting in a sealed container, so after letting it dry it weighed in at 8.0g instead of 9.4 which is still not bad. Of course, that's also re-x'ed from DCM which according to the

smell might be contaminated with some carbonyl of some sort, so I'll try doing an alcohol re-x or maybe an alcohol/add water and cool type of purification. Hoffman resulted in 1.7g amine hydrochloride.

105mg of this taken orally was *TOO* much for about 1.5 hours. Total duration was 12 hours (until pupils were normal and sleep was possible). While vomiting a mixture of bad karma, negative energy, and previously consumed food, I recalled someone on this site referring to 100mg as "scary potent". Makes me wonder about the stereochemistry of this reaction product. Perhaps it is only one isomer or the other? I mean, is the amine from the hoffman degradation racemic or what? I know that the amines generated through reductive amination are 50/50 racemic.

Also I used 30% H2O2 which was at room temp (about 25*C), and only 60ml.

Report to moderator Logged

P!ssedSc!ent!st

Subordinate Wasp

Posts: 100

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #134 on:** September 16, 2015, 04:05:20 AM »

Are you saying the 8.0g of amide you got only Hoff'd into 1.7g amine?!
What method Are you using?

Also: lysurgeon, you mentioned a bicarbonate buffering system for the maintenance of PH during oxidation. I researched a bit and found a formula for a bicarbonate buffering system
Using a tiny bit of NaOH and bicarbonate in h2o, is this the same thing you are referring to?
And to be clear, you should add the normal NaOH before oxidizing correct?
Then use the buffer to attenuate the PH after the fact ?

« *Last Edit: September 16, 2015, 06:26:14 AM by P!ssedSc!ent!st* » Report to moderator Logged

Flasky Mountain Flask

Pupae

Posts: 70

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #135 on:** September 16, 2015, 07:29:40 AM »

Actually just used NaOH. But used it to maintain pH appx 11-12.

Hoffman method is with Ca(ClO)2. My failing point with the hoffman is actually that I haven't been giving it enough time to run to completion, and that I haven't applied intense rigorous purification to the amide. Only been running it at about 5 hours total.

Report to moderator Logged

P!ssedSc!ent!st

Subordinate Wasp

Posts: 100

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #136 on:** September 17, 2015, 12:07:50 AM »

Well on the for real, use TCCA. You're doing work to great to be wasting it

And it was Unlikely_username who mentioned the bicarbonate system. I'll keep it simple when its tested and just use naoh + h2o

« *Last Edit: September 17, 2015, 12:17:37 AM by P!ssedSc!ent!st* » Report to moderator
Logged

Scarecrow
Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #137 on:** September 17, 2015, 02:51:51 AM »

Interesting, there have been many runs where I have been left with this yellow goo. Ive always assumed its unreacted nitrile or something. If I use an excess of hydroxylamine HCl i ALWAYS get the yellow goo. Ive always just chucked it out, recrystalization has never given me anything good but mind you I never attempted DCM.

Interesting...

Hate to think how much potential amide I might have wasted

« *Last Edit: September 17, 2015, 02:55:42 AM by Scarecrow* » Report to moderator
Logged

It's a war on personal freedom, that's what it is.

unlikely_username
Subordinate Wasp

Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #138 on:** September 17, 2015, 04:31:51 AM »

Pictures of a 100g run performed by my associate with posted optimizations.
The precipitated product was stirred in 300mL cold H2O for a bit to extract any residual DMSO, inorganics, and water soluble side products.
This was then vacuum filtered again and the beaker just used to wash was rinsed with 100mL cold H2O, which was poured onto the product in the filter funnel once the initial filtration was complete.
This was allowed to dry under suction for a bit, crude weight at 98.2g slightly damp, then placed in a vacuum desiccator for full drying. Will report back with overall yield.

mountain1.png (385.66 kB, 409x542 - viewed 234 times.)

mountain2.png (242.57 kB, 409x545 - viewed 217 times.)

CHEMICALCOWBOY36

Subordinate Wasp

Posts: 222

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #139 on:** September 17, 2015, 05:04:11 AM »

Fucking beautiful man you bees have really improved this thread

In this, you must never lapse. Even those who would be our allies would not understand. Our domain is the shadow. Stray from it reluctantly, for when you do, you must strike hard ,fast and fade away... Without a trace.

P!ssedSc!ent!st

Subordinate Wasp

Posts: 100

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #140 on:** September 17, 2015, 08:38:41 AM »

Igor ran this using the optimizations:

75g Aldehyde
375mL DMSO
28.125g NH2OH

20.25g NaOH in
490mL (d) H2O
450mL 27% H2O2

~200mL MeOh - to keep nitrile in solution [i think it presents as that reddish oil that separates right?]
~200mL "extra strong NaOH soln" (what i mean by this is i just poured some lye into bout 200ml h2o - i estimate about 15gs or more, the purpose was just to have a strongly basic PH buffer with very little water, could have done less, but you have to be more careful how much you add at a time that way...)

Mixed and chilled NaOH soln. (i chill it in case i need temp control at that juncture, makes it easy)
Mixed Hydroxylamine with DMSO in 1L RBF w/mag stir until no chunks remain. added voldemelon, let stir till homogenous. headted on boiling water bath.
ATTN FUCK UP i didnt see that the mixtures temp had hit 130*C and it sat there for a good 10 mins before i got it handled back down to 100*. Where it stayed BEAUTIFULLY and consistently for the full 60 minutes [for ONCE] but it was dark, dark red at the very beginning.
after the hour it was cooled with ice bath to 60*C and the cold NaOH sold was added over 5 mins, temp never went over 70*
when there was about half the NaOH left you could see the little blobs of red oil floating around. it smelled like garlic for some reason then too... 10mL of MeOH added...slowly added more till i was satisfied with the solution of the red stuff. this was monitored very closely and every time i saw more undissolved reddish blobs, more MeOH was added in 5-10mL portions as needed.i ended up with about 75mL at first and then added more as it heated up etc. before adding the h2o2 i put everything in a 2L RBF.
after NaOH addn, the PH was only 7. so i added some of the extra strong NaOH soln until i had PH 12, then began adding H2O2 slowly with a dropper at first, then once i guaged how the mixture would react i put the rest of the

H2O2 in the addition funnel and kept the rate so that the temp stayed under 90* but never under 60*. Ice bath was used as needed. again, throughout the oxidation process, additional MeOH and conc. NaOH soln were added to maintain PH between 8-11 as best as possible [i never went over 12 this run] but PH 10 was the target. I checked the PH a LOT.
when there was only about 100mL left of H2O2 there were little floating dark red blobs, not translucent like the nitrile blobs, more gummy and opaque, heat eventually dissolved them along with methanol and proper PH. only had maybe 1-2 left at the very end. there was a lot of foaming that had to be controlled even in my 2L RBF at firsst when adding the peroxide.
at the end igor had a very pretty yellow almost clear homogenous solution. it was stirred for 40 mins without heat. then it was stirred an additional hour with hot water bath up to 90* to strip alcohols [may actually have to go longer, i used a lot of meoh]

EDIT:
after sitting still for 12 hours or so the bottom of the 2L flask is FULL PACKED with xtals, i poured off the orange BEAUTIFUL smelling liquid [should we save this and start checking it for mdp2p or other nice smelling impurities?] and placed it in the fridge to see if any more xtals come out.
waiting for xtals to dry now and will give weight soon

THE OPTIMIZATION WORKS WONDERS - THANK YOU UNLIKELY

« *Last Edit: September 17, 2015, 11:41:43 PM by P!ssedSc!ent!st* » Report to moderator Logged

Burgi-Dunit-Again
Subordinate Wasp
Posts: 176

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #141 on:** September 17, 2015, 08:36:26 PM »

Quote from: d00d00d00 on September 12, 2015, 10:43:01 PM

> The doctor attempted the aqueous nh3 -> nitrile variant.
>
> Upon addition of the aldehyde to the aqueous nh3 and stirring via magnetic stirring the solution went pink? The solution was stirred continuously while TCCA was added very slowly. Color changes went from orange, to brown, then a precipitate (brown salt) began to float to the top near the end of the prescribed TCCA amount.

Strange that both mine and ceramics' original posts were deleted.. especially since the quotations are still there, but my results using DCCA were similarly dirty, and gave low yields of nitrile over a long period of time. I may put some more effort into this, though it sounds like people are having some success with the DMSO/hydroxylamine method.

Report to moderator Logged

unlikely_username
Subordinate Wasp
Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #142 on:** September 17, 2015, 09:47:47 PM »

Quote from: Burgi-Dunit-Again on September 17, 2015, 08:36:26 PM

> **Quote from: d00d00d00 on September 12, 2015, 10:43:01 PM**
>
> > The doctor attempted the aqueous nh3 -> nitrile variant.
> >
> > Upon addition of the aldehyde to the aqueous nh3 and stirring via magnetic stirring the

> solution went pink? The solution was stirred continuously while TCCA was added very slowly. Color changes went from orange, to brown, then a precipitate (brown salt) began to float to the top near the end of the prescribed TCCA amount.

> Strange that both mine and ceramics' original posts were deleted.. especially since the quotations are still there, but my results using DCCA were similarly dirty, and gave low yields of nitrile over a long period of time. I may put some more effort into this, though it sounds like people are having some success with the DMSO/hydroxylamine method.

I've been having mild success with it for the better part of a year now. I just finally got around to optimizing it to make it more repeatable, less wasteful and cleaner. A lot of people were having trouble stemming from temperature control (often excessive cooling during the peroxide addition) and what appears to me to be inconsistent acid content of commercial peroxide.

The problem was never really with the nitrile formation anyway (unless you scorch it), it was with the oxidation.

Props to you guys for testing out an alternative though, never a bad thing.

Report to moderator Logged

Burgi-Dunit-Again

Subordinate Wasp

Posts: 176

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #143 on:** September 17, 2015, 10:13:34 PM »

At least for me, the main incentive was to omit hydroxylamine. Primarily out of laziness

Report to moderator Logged

d00d

Founding Wasp

Posts: 719

Forum Moron

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #144 on:** September 18, 2015, 03:46:19 AM »

Burgi - The doctor has performed your/ceramics variant and have some things to ask/add to the discussion. Yes, the doctor also does not wish to work with hydroxylamine, at least not at high PH/Temps. He believes this is the reason why bees are having the 'WHOA EXOTHERMIC SOYUZ ROCKET' during H2O2 addition.

Upon addition of the aldehyde to the aq. NH3 was a pinkish color observed upon mechanical stirring? Undoubtedly a reaction has occurred, any guesses as to the pre-nitrile reaction? The paper is somewhat confusing. This pinkish tinge and changed solubility properties of the aldehyde has made one wonder.....
The precipitate in the nitrile formation, not the nitrile? The xylene extraction left a deep red xylene but with the high BP of xylene, why does the paper recommend drying with MgSO4? Surely the Xylene will need to be stripped off through distillation, the H2O coming first? Wouldn't there be a better extraction solvent or is the doctor missing something here? The doctor has had mixed success with oxidizing the Xylene containing the nitrile. Some MeOH (which is probably actually methoxide due to NaOH soln) is needed however.

Is the white precipitate an isocyanate?

Oh, and pissed_scientist - MeOH distills at 65C, how were you heating to 90C during oxidation and not witnessing the MeOH come flying out the flask? MeOH does not azeotropically distill with much afaik.

« *Last Edit: September 18, 2015, 04:37:41 AM by d00d00d00* »

Report to moderator

Logged

Greater knowledge through stupidity

unlikely_username

Subordinate Wasp

Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

« **Reply #145 on:** September 18, 2015, 10:26:21 AM »

Quote

Quote from: d00d00d00 on September 18, 2015, 03:46:19 AM

> Burgi - The doctor has performed your/ceramics variant and have some things to ask/add to the discussion. Yes, the doctor also does not wish to work with hydroxylamine, at least not at high PH/Temps. He believes this is the reason why bees are having the 'WHOA EXOTHERMIC SOYUZ ROCKET' during H2O2 addition.
>
> Upon addition of the aldehyde to the aq. NH3 was a pinkish color observed upon mechanical stirring? Undoubtedly a reaction has occurred, any guesses as to the pre-nitrile reaction? The paper is somewhat confusing. This pinkish tinge and changed solubility properties of the aldehyde has made one wonder.....
> The precipitate in the nitrile formation, not the nitrile? The xylene extraction left a deep red xylene but with the high BP of xylene, why does the paper recommend drying with MgSO4? Surely the Xylene will need to be stripped off through distillation, the H2O coming first? Wouldn't there be a better extraction solvent or is the doctor missing something here? The doctor has had mixed success with oxidizing the Xylene containing the nitrile. Some MeOH (which is probably actually methoxide due to NaOH soln) is needed however.
>
> Is the white precipitate an isocyanate?
>
> Oh, and pissed_scientist - MeOH distills at 65C, how were you heating to 90C during oxidation and not witnessing the MeOH come flying out the flask? MeOH does not azeotropically distill with much afaik.

The exothermia has more to do with the oxidation of the nitrile and decomposition of the peroxide than anything else AFAIK. The hydroxylamine is long consumed by this point, and there isn't any issue when the nitrile mixture is being basified, just oxidised.
The MeOH tends to evaporate as temp rises I think, but I've noticed that it tends to be gradual as long as your temperature doesn't go from 50-70C in 3us , the nitrile often stays in solution at this point without adding additional cosolvent, either due to temp or reduced concentration due to oxidation I think.

Report to moderator

Logged

P!ssedSc!ent!st

Subordinate Wasp

Posts: 100

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

« **Reply #146 on:** September 18, 2015, 10:52:29 AM »

Quote

Quote from: d00d00d00 on September 18, 2015, 03:46:19 AM

> Oh, and pissed_scientist - MeOH distills at 65C, how were you heating to 90C during oxidation and not witnessing the MeOH come flying out the flask? MeOH does not azeotropically distill with much afaik.

if i said i was heating to 90* during ox i was mistyping. i kept the temp between 60-80 the entire oxidation and added the meoh over time as i saw more of the red oil coming out of solution.

i seemed to get more frothyness when there was less meoh...maybe im just tarded

Report to moderator Logged

d00d
Founding Wasp

Posts: 719
Forum Moron

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #147 on:** September 18, 2015, 01:32:13 PM »

Quote

Quote from: unlikely_username on September 18, 2015, 10:26:21 AM

Quote from: d00d00d00 on September 18, 2015, 03:46:19 AM

Burgi - The doctor has performed your/ceramics variant and have some things to ask/add to the discussion. Yes, the doctor also does not wish to work with hydroxylamine, at least not at high PH/Temps. He believes this is the reason why bees are having the 'WHOA EXOTHERMIC SOYUZ ROCKET' during H2O2 addition.

Upon addition of the aldehyde to the aq. NH3 was a pinkish color observed upon mechanical stirring? Undoubtedly a reaction has occurred, any guesses as to the pre-nitrile reaction? The paper is somewhat confusing. This pinkish tinge and changed solubility properties of the aldehyde has made one wonder.....
The precipitate in the nitrile formation, not the nitrile? The xylene extraction left a deep red xylene but with the high BP of xylene, why does the paper recommend drying with MgSO4? Surely the Xylene will need to be stripped off through distillation, the H2O coming first? Wouldn't there be a better extraction solvent or is the doctor missing something here? The doctor has had mixed success with oxidizing the Xylene containing the nitrile. Some MeOH (which is probably actually methoxide due to NaOH soln) is needed however.

Is the white precipitate an isocyanate?

Oh, and pissed_scientist - MeOH distills at 65C, how were you heating to 90C during oxidation and not witnessing the MeOH come flying out the flask? MeOH does not azeotropically distill with much afaik.

The exothermia has more to do with the oxidation of the nitrile and decomposition of the peroxide than anything else AFAIK. The hydroxylamine is long consumed by this point, and there isn't any issue when the nitrile mixture is being basified, just oxidised.
The MeOH tends to evaporate as temp rises I think, but I've noticed that it tends to be gradual as long as your temperature doesn't go from 50-70C in 3us , the nitrile often stays in solution at this point without adding additional cosolvent, either due to temp or reduced concentration due to oxidation I think.

The Dr. claims to have experienced this exothermia upon addition of H2O2. however it is nowhere near as prominent as the others have made it out to bee. The only difference in the two procedures was that he used the hydroxylamine-less variant. Heat was applied up to 60C and then with H2O2 addition 65C was maintained after being removed from heating mantle. How "pure" is your nitrile? M.P? TLC?

Or was it not isolated.... oh wait it wasn't... Not being a dick but kind of hard to say the "hydroxylamine is long consumed" in a one-pot mash-up no?

One thing Dr.Zaius has found was that it is very easy to bring the PH up too high using NaOH during oxidation. Even to the point of suggesting that NaOH could be "too much" and Sodium Carbonate / Solvated Boiled Bicarb would

better suit it. Some MeOH is NECCESSARY if one makes the mistake of extracting the nitrile with Xylene as per the paper (Why Xylene? Why dry with MgSO4? Sense this not make) Extracting the nitrile with xylene is a guaranteed pain in the ass if one wishes to isolate the nitrile, unless the nitrile magically crashes out upon drying with MgSO4, which would then be a pain in the ass to seperate the MgSO4/Nitrile (again, makes no sense)

*Also, to the random people who keep PM'ing me, the ones that are clearly lurkers with no posts, don't message me asking for this or that. We are idiots, don't ask idiots questions, Dr.Zaius and myself know very little about chemistry. Go to school, or hit the e-books like the rest of us if you want to learn something. Even if we had the warp-whistle to Bowser's chemistry castle bypassing all 8 levels of org.chem education, WE WOULD NOT GIVE IT TO YOU. WE WORKED OUR ASSES OFF TO LEARN THE VERY LITTLE WE KNOW. READ UP, INTRODUCE YOURSELF IN THE INTRO THREADS, READ UP IN THE LIBRARY, THEN MAKE ATTEMPTS, FAIL, **SHARE**, AND ASK DUMB Q'S JUST LIKE THE MAJORITY OF US WHO DON'T HAVE B.SCI's IN CHEMISTRY.*

Report to moderator Logged

Greater knowledge through stupidity

yapyap
Larvae
Posts: 6

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #148 on:** September 18, 2015, 02:36:59 PM »

Anyone attempt the TCCA/NH3 with 10% ammonia? The paper suggests a high molar excess of ammonia. Aside from the volume in the reaction vessel, any reason why it shoudn't work? I attempted this reaction before and failed the oxidation to the amide. Don't really want to work with concentrated ammonia again.

@d00d00d00

My NH3 solution never turned pink after adding the aldehyde. A milky white goo evolved and disappeared with vigorous stirring.
The white precipitate you're getting is isocyanuric acid, which will precipitate as Cl is consumed like in the Hofmann.
In regards to the extraction solvent, just use DCM and boil off/distill after drying. IIRC the nitrile is soluble in the warm hydroxide soln.

« Last Edit: September 18, 2015, 03:28:57 PM by yapyap » Report to moderator Logged

unlikely_username
Subordinate Wasp
Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #149 on:** September 18, 2015, 02:48:37 PM »

Quote from: d00d00d00 link=topic=4280.msg54157012#msg54157012

> The Dr. claims to have experienced this exothermia upon addition of H2O2. however it is nowhere near as prominent as the others have made it out to bee. The only difference in the two procedures was that he used the hydroxylamine-less variant. Heat was applied up to 60C and then with H2O2 addition 65C was maintained after being removed from heating mantle. How "pure" is your nitrile? M.P? TLC?
>
> Or was it not isolated.... oh wait it wasn't... Not being a dick but kind of hard to say the

> "hydroxylamine is long consumed" in a one-pot mash-up no?
>
> One thing Dr.Zaius has found was that it is very easy to bring the PH up too high using NaOH during oxidation. Even to the point of suggesting that NaOH could be "too much" and Sodium Carbonate / Solvated Boiled Bicarb would better suit it. Some MeOH is NECCESSARY if one makes the mistake of extracting the nitrile with Xylene as per the paper (Why Xylene? Why dry with MgSO4? Sense this not make) Extracting the nitrile with xylene is a guaranteed pain in the ass if one wishes to isolate the nitrile, unless the nitrile magically crashes out upon drying with MgSO4, which would then be a pain in the ass to seperate the MgSO4/Nitrile
>
> ...

The nitrile has been isolated in the literature in very similar dehydration procedures in yields ranging from 94-96%, including an 84g scale synthesis. It is a very mild, very simple synthesis.
The fact that we can obtain 80+% yield from the one pot is also a good indicator that the vast majority of the aldehyde formed the nitrile, especially when you factor in the inefficiencies of the oxidation and of extraction. The yield published for this one pot synthesis is in the range of ~85-95%, so this is in line with the literature.
If we assume 92% yield of the nitrile, which is undercutting by a couple percent when you factor in the lack of mechanical loss and the published results generally being higher than this, and a 1.05 molar ratio of Hydroxylamine to aldehyde you end up with a maximum of .13 equivalents of Hydroxylamine remaining, barring any kind if side reactions between Hydroxylamine and dmso. For a 50g run of aldehyde this amounts to a max ~2.5g Hydroxylamine*HCl, or ~1.3g molecular Hydroxylamine dissolved in at least ~250ml Dmso+ the volume of your added base solution.

That is my reasoning for not expecting any problems from Hydroxylamine decomposition.
Not trying to be a dick here either but simply because I haven't isolated the nitrile myself doesn't mean I don't have a valid point.the literature is our friend.

The dehydration reference is attached. The one pot has been shared a couple times around here.

---

s-0030-1261181.pdf (125.94 kB - downloaded 107 times.)

« *Last Edit: September 18, 2015, 02:51:50 PM by unlikely_username* » Report to moderator

Logged

d00d

Founding Wasp

Posts: 719

Forum Moron

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

« **Reply #150 on:** September 19, 2015, 07:30:59 AM »

Quote

Yes, I have mused over that reference. **It only covers the nitrile formation**, it speaks not of continuing on in a one-pot to the amide, or any exothermic reactions that would occur from neglecting to isolate the nitrile.

Showing a reference saying 'they got 84%' on a different compound doesn't guarantee your yields are the same, and that the same amount of hydroxylamine is used in YOUR reaction.

Without isolation of the nitrile you have 'X' amount of NH2O2 in the flask carrying over, you also have 'X' amount of nitrile, although your guesstimation is based on reliable source it is only a guess. Even if they ran the same

aldehyde and reported the yields (haven't checked, don't think so) still isn't a certainty of the same conditions.

But here is a tidbit for you - H2O2 oxidation/hydrolysis in the non-DMSO/hydroxylamine method is NOT very exotherm... at all. If its not the hydroxylamine, its the DMSO, or whatever byproducts are left in the flask from forming the nitrile.

And hydroxylamine is known to be volatile as a base, even 2.5g as a base, heated, can produce some exothermia. Or enough to soyuz rocket something depending...

« *Last Edit: September 19, 2015, 07:44:42 AM by d00d00d00* »

Report to moderator Logged

Greater knowledge through stupidity

ijontichy

mascóns ...
Pupae

Posts: 86

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #151 on:** September 19, 2015, 12:31:29 PM »

Quote from: d00d00d00 on September 18, 2015, 03:46:19 AM

> Yes, the doctor also does not wish to work with hydroxylamine, at least not at high PH/Temps. He believes this is the reason why bees are having the 'WHOA EXOTHERMIC SOYUZ ROCKET' during H2O2 addition.

The Hydroxylamine Hydrochloride is the most stable form of all the Hydroxylamines.

Report to moderator Logged

if but for a single instant you could see this world of ours the way it really is—undoctored, unadulterated, uncensored—you would drop in your tracks!

d00d

Founding Wasp

Posts: 719

Forum Moron

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #152 on:** September 19, 2015, 06:39:33 PM »

Quote from: ijontichy on September 19, 2015, 12:31:29 PM

> **Quote from: d00d00d00 on September 18, 2015, 03:46:19 AM**
>
> > Yes, the doctor also does not wish to work with hydroxylamine, at least not at high PH/Temps. He believes this is the reason why bees are having the 'WHOA EXOTHERMIC SOYUZ ROCKET' during H2O2 addition.
>
> The Hydroxylamine Hydrochloride is the most stable form of all the Hydroxylamines.

Until you increase PH (basify) and add heat....

Actually, K. The doctor has confirmed and re-confirmed this twice. Public service anouncement time;

The "soyuz rocket" phenomena is from

basifying excess hydroxylamine and oxidizing/heating it. In any of the other non-hydroxylamine variants there is no massive exothermia when oxidizing/hydrolyzing the nitrile. Inherently, the DMSO/Hydroxylamine one-pot IS DANGEROUS and UNSTABLE. Please, extract your nitrile with Xylene/Toulene (if the DMSO will let it go) add it to a new pot, mix in a equivolume 50/50 methanol/H2O solution and basify with 3 molar excess NaOH. Then oxidize with your method of choice (perborate/percarbonate/heat/H2O2/etc/etc) External cooling is not needed with ANY of the other 14 or so nitrile-->amide methods, in fact, heating/reflux is NECESSARY! YOU HAVE BEEN WARNED! DO NOT SCALE THE ONE-POT UP! IN FACT, THERE IS NO SAFE ONE POT WITH HYDROXYLAMINE, PERIOD.

« *Last Edit: September 20, 2015, 10:44:24 PM by d00d00d00* »

Report to moderator

Logged

Greater knowledge through stupidity

P!ssedSc!ent!st

Subordinate Wasp

Posts: 100

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

« **Reply #153 on:** September 22, 2015, 06:08:41 PM »

Quote

At the end of 3 rextals and one good cold water wash on the Buchner I had 45dry grams from the 75g helional I put into the improved amide procedure.

« *Last Edit: September 23, 2015, 03:17:34 AM by P!ssedSc!ent!st* »

Report to moderator

Logged

unlikely_username

Subordinate Wasp

Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

« **Reply #154 on:** September 24, 2015, 06:50:19 PM »

Quote

Quote from: d00d00d00 on September 19, 2015, 06:39:33 PM

Quote from: ijontichy on September 19, 2015, 12:31:29 PM

Quote from: d00d00d00 on September 18, 2015, 03:46:19 AM

Yes, the doctor also does not wish to work with hydroxylamine, at least not at high PH/Temps. He believes this is the reason why bees are having the 'WHOA

> EXOTHERMIC SOYUZ ROCKET' during H2O2 addition.

> The Hydroxylamine Hydrochloride is the most stable form of all the Hydroxylamines.

> Until you increase PH (basify) and add heat....
>
> Actually, K. The doctor has confirmed and re-confirmed this twice. Public service anouncement time;
>
> [...]

I'd like to note that I agree Hydroxylamine is a fairly dangerous compound, and you shouldn't handle it if you don't know what you're doing. Seriously.

That being said, barring any massive quantity of unreacted hydroxylamine, which is unlikely if you're running the dehydration portion of this reaction correctly and not using more than a 5% excess of hydroxylamine, there is a significant but not particularly dangerous amount of energy available from the base catalyzed decomposition of residual hydroxylamine. For one thing, the reaction forming the nitrile has been shown to run to completion quite easily, both in the literature and on the bench by myself and several others. It necessarily does so for a two step reaction that reliably produces amide yields in excess of 80% when run correctly. That is, the combined loss of potential product is less than 20%. The paper detailing the dehydration reaction shows that the nitrile formation alone reliably produces yields well in excess of 90%, with 93-99% being quite common with a variety of substrates. This means that there is almost always less than 10% unreacted substrate, probably significantly lower than that when you account for mechanical loss and side reactions.
Say we pretend those last two items don't exist for the moment, and let's say that we're running a 50g one-pot in 250ml DMSO, using 19g Hydroxylamine*HCl (~1.05 molar equiv.).
If only 90% of the aldehyde reacts, we're left with (19/1.05)*0.1+0.05*19 = 2.76g Hydroxylamine HCl = 0.0397 moles
Hydroxylamine has a heat of decomposition of ~636 kJ/mol in basic solution. *Which is high. I reiterate, this is a fucking explosive. Don't be an idiot.*
If we calculate it out we get an available energy of ~25248 J for the quantity of Hydroxylamine given above.
At a molar mass of 78.13 g/mol, density of ~1.1g/mL and a specific heat of 153 J/(mol*K), a 250mL sample of pure DMSO would rise ~47* C if all this energy were released into it in an instant. This is significant exothermia, but not exactly something that makes the reaction dangerous. Especially when the volumes of basic solution and peroxide solution added are factored in. Additionally, the decomposition takes place over a period of time, meaning this isn't going to result in as extreme of a temperature change as it would if you just somehow instantly shot 25 kJ of heat energy into it.
With mild cooling, sometimes none at all, and careful addition, it is really quite easy to perform this reaction without any runaway exothermia. It actually has required heating to initiate on several occasions. I and several others have performed it many times without anything more extreme than a mess to mop up from boilover due to haste during the addition.

On a side note, I question is the wisdom of adding a chlorinating agent to a conc. ammonia solution. Nitrogen trichloride is an incredibly dangerous and unstable substance, and can formed quite easily by chlorinating ammonia with TCCA. It does not share NI3's lack of sensitivity when wet, and I've heard stories of it exploding underwater when it comes in contact with organics. I wouldn't run something like that personally, but it appears people have done so without explosions. I would personally advise members to avoid touching such a reaction unless they are quite certain they know what they're doing. It

has the potential to be incredibly dangerous for the inexperienced, and even when you know what you're doing it's still very easy to get hurt.

Ref. for heat of decomposition:
http://www.nt.ntnu.no/users/skoge/prost/proceedings/aiche-2004/pdffiles/papers/538b.pdf

Report to moderator Logged

Burgi-Dunit-Again
Subordinate Wasp
Posts: 176

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #155 on:** September 24, 2015, 07:49:51 PM »

Quote

Aldoximes form relatively quickly. If you are paranoid about excess hydroxylamine, why not just use a 1:1 molar ratio or even slightly less than 1 equivalent of hydroxylamine relative to your aldehyde? Or even pre-form and extract the oxime?

I, for one, would take a slight decrease in yield over a decrease in fingers or eyes

Report to moderator Logged

unlikely_username
Subordinate Wasp
Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #156 on:** September 24, 2015, 08:11:17 PM »

Quote

Quote from: Burgi-Dunit-Again on September 24, 2015, 07:49:51 PM

> Aldoximes form relatively quickly. If you are paranoid about excess hydroxylamine, why not just use a 1:1 molar ratio or even slightly less than 1 equivalent of hydroxylamine relative to your aldehyde? Or even pre-form and extract the oxime?
>
> I, for one, would take a slight decrease in yield over a decrease in fingers or eyes

Previously I was more concerned about wasting aldehyde than hydroxylamine and wanted to push the reaction to completion. Lately hydroxylamine is actually more precious than Helional, so I've actually been thinking about just using a 1:1 ratio.

I've never been particularly concerned about the hydroxylamine content, but since it was being repeatedly raised as a concern I thought the issue should be addressed in a reasonably scientific fashion instead conjecture. I found the possible heat due to hydroxylamine decomposition to be higher than I would've first thought, but ultimately not of much concern.

Report to moderator Logged

Burgi-Dunit-Again
Subordinate Wasp
Posts: 176

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #157 on:** September 25, 2015, 12:15:57 AM »

Quote

Sadly, the real risk here is not for anyone with a reasonable working knowledge of organic chemistry.

Who will suffer from these one-pot procedures involving explosive

intermediates, especially if they become more popular (which tends to correlate with reagent accessibility) , are people looking to make large quantities of ***OMGEEZ suiper Potent TRIPle stack Sasserfr@ss*** without having taken the time to learn basic chemical principles. They will add epsom salt and perhaps food colouring to their product, and insist it is a symbol of purity. They will brag to their friends that they are self-taught organic chemists, and autodidacts on the level of Ernest Hemmingway or Leonardo da Vinci.

Such a person may, for instance, be too impatient to allow complete oxime formation. Or assume it will take place at room temperature, only to hurt themselves during the hydrolysis at large scale.
Similarly, they may attempt the ammonia variant and decide that slow addition of the oxidant must be unnecessary, and only for old people.

I have met someone not too long ago who attempted to hasten the drying of butane hash oil with a gas burner. It is difficult to protect people from themselves This CAN be a very rewarding and safe hobby, though some manage to make it both EXTREMELY dangerous, and not rewarding at all.

Report to moderator Logged

unlikely_username
Subordinate Wasp
Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #158 on:** September 25, 2015, 07:18:30 AM »

Quote

Quote from: Burgi-Dunit-Again on September 25, 2015, 12:15:57 AM

> Sadly, the real risk here is not for anyone with a reasonable working knowledge of organic chemistry.
>
> Who will suffer from these one-pot procedures involving explosive intermediates, especially if they become more popular (which tends to correlate with reagent accessibility) , are people looking to make large quantities of ***OMGEEZ suiper Potent TRIPle stack Sasserfr@ss*** without having taken the time to learn basic chemical principles. They will add epsom salt and perhaps food colouring to their product, and insist it is a symbol of purity. They will brag to their friends that they are self-taught organic chemists, and autodidacts on the level of Ernest Hemmingway or Leonardo da Vinci.
>
> Such a person may, for instance, be too impatient to allow complete oxime formation. Or assume it will take place at room temperature, only to hurt themselves during the hydrolysis at large scale.
> Similarly, they may attempt the ammonia variant and decide that slow addition of the oxidant must be unnecessary, and only for old people.
>
> I have met someone not too long ago who attempted to hasten the drying of butane hash oil with a gas burner. It is difficult to protect people from themselves This CAN be a very rewarding and safe hobby, though some manage to make it both EXTREMELY dangerous, and not rewarding at all.

I agree completely. I added two disclaimers to the post for that reason. But quite frankly, if you try to make illegal drugs solely for profit and you can't even be bothered to examine the risks, you're no better than a fucking shake n bake meth cook.
I like that triple stack reference haha, I I've got a buddy who's been asked if his crystals were double stacked. I have no words to properly describe my hilarity upon hearing that.

I just gave up a long time ago doing much more than giving fair warning. I've been that idiot before, and generally it's only experience that tells you to stop being a jackass. It's far too easy to become overconfident when you're teaching yourself. The presence of a prof who knows their shit is both quite

humbling and incredibly rewarding.

Report to moderator Logged

Flasky Mountain Flask

Pupae

Posts: 70

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #159 on:** September 25, 2015, 09:10:13 AM »

Tried a modification of this process on a 0.1M scale (19.2g melon, 6.95g hydroxylamine-HCl, in 100ml DMSO) heated for 2 hours at 85*C, the reaction was diluted with water and extracted 3x with 100ml DCM. This was distilled off to yield a yellow oil which was taken up in 200ml 95% ethanol and basified with NaOH in H2O to pH 12, then the 30%H2O2 was added, though addition was stopped when it caused the formation of a brown oily precipitate. 50.0g of the peroxide solution remained. Perhaps the H2O2 amount can be taken down to about 80-85g (72-76 ml) per 0.1M. The alcohol was evaporated to yield a white crystalline mass. The mass was then cleaned up with water, alcohol and DCM to yield super-pure-white 9.4g amide crystals.

The low yield was due to 2 things:

1. Nothing ever goes right the first time you try it (in this case, isolating the nitrile prior to oxidation)
2. Mechanical losses were maximal. A nonchalant attitude toward disposing of slightly impure amide by the gram was taken, and though the amide yield was low, the purity was high. That pretty aroma was completely absent.

Of note is that at some point the distinct smell of piperonal was noted. And addition of H2O2 was not very exothermic at all and was able to be accomplished much more quickly than expected.

Also I feel compelled to point out for those who don't know about it, the "Soyuz" thing that keeps coming up is humorously referencing a hyperlab post from the 90's which turned on the hive bees to the wonders of al/hg for nitropropene reduction. The poster mentioned something about how it felt like he was standing at the launch pad of the Baikonur Cosmodrome which is where the "Sovs" or "Ruskies" launch all their spacecraft from. And they still use the Soyuz system, which was invented in the late 1960s. Oldest spacecraft design still in use today. It's no Voskhod, and nothing like the Saturn V.

« Last Edit: September 25, 2015, 10:54:09 PM by lysurgeon »

Report to moderator Logged

d00d

Founding Wasp

Posts: 719

Forum Moron

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #160 on:** September 26, 2015, 10:48:19 PM »

Quote from: lysurgeon on September 25, 2015, 09:10:13 AM

> Tried a modification of this process on a 0.1M scale (19.2g melon, 6.95g hydroxylamine-HCl, in 100ml DMSO) heated for 2 hours at 85*C, the reaction was diluted with water and extracted 3x with 100ml DCM. This was distilled off to yield a yellow oil which was taken up in 200ml 95% ethanol and basified with NaOH in H2O to pH 12, then the 30%H2O2 was added, though addition was stopped when it caused the formation of a brown oily precipitate. 50.0g of the peroxide solution remained. Perhaps the H2O2 amount can be taken down to about 80-85g (72-76 ml) per 0.1M. The alcohol was evaporated to yield a white crystalline mass. The mass was then cleaned up with water, alcohol and DCM to yield super-pure-white 9.4g amide crystals.

> The low yield was due to 2 things:
>
> 1. Nothing ever goes right the first time you try it (in this case, isolating the nitrile prior to oxidation)
> 2. Mechanical losses were maximal. A nonchalant attitude toward disposing of slightly impure amide by the gram was taken, and though the amide yield was low, the purity was high. That pretty aroma was completely absent.
>
> Of note is that at some point the distinct smell of piperonal was noted. And addition of H2O2 was not very exothermic at all and was able to be accomplished much more quickly than expected.
>
> Also I feel compelled to point out for those who don't know about it, the "Soyuz" thing that keeps coming up is humorously referencing a hyperlab post from the 90's which turned on the hive bees to the wonders of al/hg for nitropropene reduction. The poster mentioned something about how it felt like he was standing at the launch pad of the Baikonur Cosmodrome which is where the "Sovs" or "Ruskies" launch all their spacecraft from. And they still use the Soyuz system, which was invented in the late 1960s. Oldest spacecraft design still in use today. It's no Voskhod, and nothing like the Saturn V.

Yes, I am aware of what the "Soyuz" Russian icbm/space missile from the 1960s is and that's why its a funny joke. But good on you for pointing it out for those who do not know.

And thanks for proving that if you isolate the nitrile, there is no crazy exothermic reaction, due to the excess hydroxylamine/whatever. All precision stoichiometry aside, it would seem that EVERYONE doing the 'one-pot' variant had problems with runaway reactions at one point in their research. When my colleague Dr.Zaius ran several different variations of this synthesis, the only one which almost ran-away and required external cooling during amide formation was the one-pot dmso/hydroxylamine even with triple-checked stoichiometry. This is why the "one pot" is essentially dangerous and should not be attempted at scale. Isolating the nitrile would mean "two pot". Which isn't even a big deal really. Easy-peasy lemon squeezy, or 'facile' if you wish.

It would seem that an alkene is a better solvent to pull the nitrile out, the nitrile is also a dark red oily mess, so keeping it in soln is advised.

« Last Edit: September 26, 2015, 10:58:50 PM by d00d00d00 »

Report to moderator Logged

Greater knowledge through stupidity

CHEMICALCOWBOY36

Subordinate Wasp

Posts: 222

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #161 on:** September 26, 2015, 11:13:42 PM »

Great to hear fellow bees but if were isolating the nitrile why not try using Sodium percarbonate! 😎

THE TRANSFORMATION OF NITRILES INTO AMIDES USING SODIUM PERCARBONATE.pdf
(215.71 kB - downloaded 104 times.)

Report to moderator Logged

In this, you must never lapse. Even those who would be our allies would not understand. Our domain is the shadow. Stray from it reluctantly, for when you do, you must strike hard ,fast and fade away... Without a trace.

d00d

Re: FACILE ONE-POT CONVERSION

Quote

Founding Wasp

Posts: 719

Forum Moron

OF ALDEHYDES INTO AMIDES results

« **Reply #162 on:** September 27, 2015, 12:11:32 AM »

Quote from: TCdboy28 on September 26, 2015, 11:13:42 PM

> Great to hear fellow bees but if were isolating the nitrile why not try using Sodium percarbonate!

Yeah, there's like 14 possible nitrile-amide methods. All of them very FACILE. Some of them include, reflux + methanol for 5h, perborate, reflux for 12h w/ base, H2SO4, and more. Basically anything works, just pick one that works for your situation/reagent availability/time. Perhaps I will start another thread with yield/work-up information on the various different methods and how well they work in our situation. With help from others we could run most of the methods and find out which ones work best.

Also, NCl3 formation is NOT a risk in the "other" variant to nitrile. Read the paper, there is only a risk of major effervescence upon addition of the TCCA/DCCA to the solution if not added slowly (an explosive reaction, with MUCH chlorine gas, but not a NCl3 type of explosion) There are multiple reasons why NCl3 cannot be formed in this case, the reaction proceeds through 3 intermediaries pre-nitrile and one of them only forms in the ABSENCE of HCl, HCl that would need to be present IN EXCESS to form NCl3. Dr.Zaius has done extensive trials with this method, examining all precipitates and boiling all solutions to dryness to examine/identify any compounds resulting from the reaction. This is dangerous and I do not recommend doing it but the Doctor is an inquisitive gorilla and had to know why the paper would have missed such an obvious *caution* with respect to the NCl3. Turns out, no danger, no worry (perhaps there is a one in a million chance or something of the sort but not a tangible danger)

« *Last Edit: September 27, 2015, 12:19:52 AM by d00d00d00* »

Report to moderator

Logged

Greater knowledge through stupidity

tyronious

Larvae

Posts: 10

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #163 on:** September 27, 2015, 07:19:56 AM »

Quote from: d00d00d00 on September 27, 2015, 12:11:32 AM

> **Quote from: TCdboy28 on September 26, 2015, 11:13:42 PM**
>
> > Great to hear fellow bees but if were isolating the nitrile why not try using Sodium percarbonate!
>
> Yeah, there's like 14 possible nitrile-amide methods. All of them very FACILE. Some of them include, reflux + methanol for 5h, perborate, reflux for 12h w/ base, H2SO4, and more. Basically anything works, just pick one that works for your situation/reagent availability/time. Perhaps I will start another thread with yield/work-up information on the various different methods and how well they work in our situation. With help from others we could run most of the methods and find out which ones work best.
>
> Also, NCl3 formation is NOT a risk in the "other" variant to nitrile. Read the paper, there is only a risk of major effervescence upon addition of the TCCA/DCCA to the solution if not added slowly (an explosive reaction, with MUCH chlorine gas, but not a NCl3 type of explosion) There are multiple reasons why NCl3 cannot be formed in this case, the reaction

> proceeds through 3 intermediaries pre-nitrile and one of them only forms in the ABSENCE of HCl, HCl that would need to be present IN EXCESS to form NCl3. Dr.Zaius has done extensive trials with this method, examining all precipitates and boiling all solutions to dryness to examine/identify any compounds resulting from the reaction. This is dangerous and I do not recommend doing it but the Doctor is an inquisitive gorilla and had to know why the paper would have missed such an obvious *caution* with respect to the NCl3. Turns out, no danger, no worry (perhaps there is a one in a million chance or something of the sort but not a tangible danger)

errm just out of curiosity, could we see a ref on the whole NCl3 only forming in presence of excess HCl? NCl3 forms from chlorinator(TCCA) and ammonia. If HCl was present im sure acid/base chemistry would take over... eliminating the possibility of NCl3 formation.

Report to moderator Logged

unlikely_username

Subordinate Wasp

Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #164 on:** September 28, 2015, 01:51:30 PM »

> **Quote from: tyronious on September 27, 2015, 07:19:56 AM**
>
> errm just out of curiosity, could we see a ref on the whole NCl3 only forming in presence of excess HCl? NCl3 forms from chlorinator(TCCA) and ammonia. If HCl was present im sure acid/base chemistry would take over... eliminating the possibility of NCl3 formation.

I'd have to second this. HCl is in no way required for the halogenation of ammonia. Just free halogen.
The synthesis of these compounds is generally as simple as dumping your halogen into ammonia solution, which is what has been described here. I just synthesized some of this in microscale for a lab prac.

Report to moderator Logged

Flasky Mountain Flask

Pupae

Posts: 70

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #165 on:** September 28, 2015, 02:41:53 PM »

http://www.ark.chem.ufl.edu/Published_Papers/PDF/045-MASS.pdf

This paper describes the conversion of nitriles to amides using basic peroxide in DMSO. Apparently this is the reason why the "facile one-pot" paper has both steps going on in the same solvent. I wish there was an easier way to remove excess hydroxylamine - maybe by adding excess aldehyde, so that with basification comes oximation instead of just extra hydroxylamine sitting there getting oxidized.

For safety concerns it seems it would be best to extract the nitrile out from the first DMSO solution and dissolve in a second DMSO solution for the peroxide addition, if following that particular method.

Also a quick question, as I have not the chemistry smarts to answer this myself: is the MDA from the hoffman degradation racemic or is it only one isomer?

Report to moderator Logged

Re: FACILE ONE-POT

Burgi-Dunit-Again

Subordinate Wasp

Posts: 176

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #166 on:** September 28, 2015, 08:05:28 PM »

You could add some formaldehyde to wash up excess hydroxylamine, though I have no idea what the product's redox or stability properties are.. could be as bad or worse.

And the amine coming out of this hoffman rearrangement is racemic. There is no chiral molecule used anywhere in the synthesis, so nothing to impart any asymmetry. Racemic is actually what you want for MDX though

Report to moderator Logged

thewire

Dominant Wasp

Posts: 426

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #167 on:** September 28, 2015, 08:33:35 PM »

Synthesis, 1988, p 715
Liu, Kwang-Ting; Shih, Mei-Hsiu; Huang, Hsiau-Wen; Hu, Chia-Juei:
Catalytic Hydration of Nitriles to Amides with Manganese Dioxide on Silica Gel
---
Homogeneous and Stereoselective Copper(II)-Catalyzed Monohydration of Methylenemalononitriles to 2-Cyanoacrylamides
X. Xin, D. Xiang, J. Yang, Q. Zhang, F. Zhou, D. Dong, J. Org. Chem., 2013, 78, 11956-11961.

http://www.organic-chemistry.org/abstracts/lit4/277.shtm

Mild and Selective Heterogeneous Catalytic Hydration of Nitriles to Amides by Flowing through Manganese Dioxide
Claudio Battilocchio, Joel M. Hawkins and Steven V. Ley*

C. Battilocchio, J. M. Hawkins, S. V. Ley, Org. Lett., 2014, 16, 1060-1063.
http://www.organic-chemistry.org/abstracts/lit4/394.shtm

Russian Chemical Reviews, Volume 53, Number 9 , p 900
New Trends in the Hydration of Nitriles
E N Zil'berman

http://iopscience.iop.org/article/10.1070/RC1984v053n09ABEH003130/meta
---
A heterogeneous catalytic method for the conversion of nitriles into amides using molecular sieves modified with copper(II)
Tetrahedron Letters
Volume 52, Issue 45, 9 November 2011, Pages 6021–6023

Synthesis of amides from nitriles
US 3366639 A

"*Example 3.Benznitrile in dioxane solution A solution of 4.96 grams of benzonitrile in 100 milliliters of dioxane was stirred at reflux with 10.0 grams of manganese dioxide for five hours. Filtration and evaporation aiforded 5.35 grams (92 percent) of crystals of benzamide, melting point 125128. The infrared spectrum showed little or no unreacted benzonitrile.* "

Conversion of nitrile to its corresponding amide using improved copper oxide

catalyst
US 3846495 A

Mechanism of the Reaction of Nitriles with Alkaline Hydrogen Peroxide. Reactivity of Peroxycarboximidic Acid and Application to Superoxide Ion Reaction
Bulletin of the Chemical Society of Japan
Vol. 54 (1981) No. 3 P 793-799

Allen, C. Liana, Lapkin, Alexei and Williams, Jonathan M. J.. (2009)
An iron-catalysed synthesis of amides from nitriles and amines.
Tetrahedron Letters, Vol.50 (No.29). pp. 4262-4264.

(Scheme 5. Reaction in the absence of amine)

Letters in Organic Chemistry, 2009, 6, 175-179 175
Efficient Hydrolysis of Nitriles to Amides with Hydroperoxide Anion in Aqueous Surfactant Solutions as Reaction Medium
Lucia Brinchi, Lisa Chiavini, Laura Goracci, Pietro Di Profio and Raimondo Germani*

---

s-1988-27684.pdf (190.98 kB - downloaded 50 times.)
10.1021@ol403591c.pdf (532.51 kB - downloaded 50 times.)
10.1021@jo401997v.pdf (383.24 kB - downloaded 47 times.)
10.1070@RC1984v053n09ABEH003130.pdf (2041.51 kB - downloaded 46 times.)
10.1016@j.tetlet.2011.09.012.pdf (789.86 kB - downloaded 47 times.)
US3366639.pdf (461.98 kB - downloaded 47 times.)
US3846495.pdf (347.57 kB - downloaded 52 times.)
54_793.pdf (1197.97 kB - downloaded 50 times.)
10.1016@j.tetlet.2009.05.021.pdf (550.58 kB - downloaded 52 times.)
Letters in Organic Chemistry, 2009, 6, 175-179 175.pdf (80.26 kB - downloaded 52 times.)

« *Last Edit: September 28, 2015, 10:43:13 PM by thewire* » Report to moderator Logged

P!ssedSc!ent!st
Subordinate Wasp
Posts: 100

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #168 on:** September 29, 2015, 10:21:38 PM »

Quote

Quote from: lysurgeon on September 28, 2015, 02:41:53 PM

http://www.ark.chem.ufl.edu/Published_Papers/PDF/045-MASS

Also a quick question, as I have not the chemistry smarts to answer this myself: is the MDA from the hoffman degradation racemic or is it only one isomer?

I second this question. Because when making the sulfate vs the hcl salt of the amine there have been reports of different subjective effects. Hcl being 'trippier' And sulfate being more 'rolly'
Is it Possible that the nectar we are getting is actually (d)-floramellionallamelonamort and hcl has no effect on the isomers but h2so4 racemizes the mixture?

Because feel like I've read that the original synthesis of Dexedrine was done with racemically pure a-methylhydrocinnamic acid (correct me if I'm wrong) and then converted to amide and hoff'd into Dexedrine. That's what made me think of this too

Oh and burgi I just saw you kinda answered that too... Hm well ...

« *Last Edit: September 29, 2015, 10:35:16 PM by P!ssedSc!ent!st* » Report to moderator Logged

Burgi-Dunit-Again

Subordinate Wasp

Posts: 176

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote

« **Reply #169 on:** September 30, 2015, 04:45:15 AM »

Even if you started with enantiomerically pure helional, you would likely racemize your material in the high pH environment used for formation of the chloramide in the hofmann rearrangement. The amide alpha protons are roughly as acidic as those on the nitrogen itself, so if you are deprotonating the nitrogen you are deprotonating there as well to transiently give the a,b unsaturated species. When this happens you lose chirality, if it was even there to begin with, which I doubt

Report to moderator Logged

pyrrolidin

Subordinate Wasp

Posts: 121

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote

« **Reply #170 on:** October 01, 2015, 09:13:25 PM »

> **Quote from: Burgi-Dunit-Again on September 30, 2015, 04:45:15 AM**
>
> Even if you started with enantiomerically pure helional, you would likely racemize your material in the high pH environment used for formation of the chloramide in the hofmann rearrangement. The amide alpha protons are roughly as acidic as those on the nitrogen itself, so if you are deprotonating the nitrogen you are deprotonating there as well to transiently give the a,b unsaturated species. When this happens you lose chirality, if it was even there to begin with, which I doubt

For sure the a-carbon will epimerize to some degree under normal ROCl or TCCA Hoffmann conditions.
However this reference gives enantiomerically pure products in high yields:
https://www.thevespiary.org/talk/index.php?topic=2473.msg54153823#msg54153823

Report to moderator Logged

d00d

Founding Wasp

Posts: 719

Forum Moron

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote

« **Reply #171 on:** October 02, 2015, 06:01:23 AM »

My bad about the excess of HCl thing, but its 'kinda' true in a way. NCl3 only forms when a salt species of ammonia + chlorine. Not with ammonium hydroxide.

https://en.wikipedia.org/wiki/Nitrogen_trichloride

> **Quote**

> The compound is prepared by treatment of ammonium salts, such as ammonium nitrate with chlorine.

It also hydrolyzes in hot water to release ammonia and hypochlorous acid. So, double not happening. The paper gives no warning, and this is why (we assume)

There is danger if one was to use NH4Cl solution, which is where the original danger comes from in swimming pools (Ammonium Chloride is used as an algeacide)

« *Last Edit: October 02, 2015, 06:06:14 AM by d00d00d00* » Report to moderator Logged

Greater knowledge through stupidity

unlikely_username

Subordinate Wasp

Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #172 on:** October 02, 2015, 08:28:03 AM »

> **Quote from: d00d00d00 on October 02, 2015, 06:01:23 AM**
>
> My bad about the excess of HCl thing, but its 'kinda' true in a way. NCl3 only forms when a salt species of ammonia + chlorine. Not with ammonium hydroxide.
>
> https://en.wikipedia.org/wiki/Nitrogen_trichloride
>
> > **Quote**
> >
> > The compound is prepared by treatment of ammonium salts, such as ammonium nitrate with chlorine.
>
> It also hydrolyzes in hot water to release ammonia and hypochlorous acid. So, double not happening. The paper gives no warning, and this is why (we assume)
>
> There is danger if one was to use NH4Cl solution, which is where the original danger comes from in swimming pools (Ammonium Chloride is used as an algeacide)

It's nothing personal, we're all going to be wrong sometimes with this. I believe you caught me confusing the formation a of a substituted urea side product in the hoffmann with the formation of urethane linkages in some other thread (woops 😎).

This is a subject I rather obligated to nitpick to death because of the compound in question, if I don't say anything and ended up being correct I'd feel somewhat responsible.

I believe the route given by wikipedia is an example of how it has been prepared commercially or on a lab scale(?).
It does not *require* the use of ammonium salts, the aqueous freebase is quite happy to react with free chlorine at RT.
See below video for an example of household (9-10%) ammonia forming NCl3 when dripped onto a tablet of TCCA:
https://www.youtube.com/watch?v=9A9Fg-hJy-4

Granted the concentration of free chlorine is quite high here, I don't expect anything quite so immediately hazardous, but it does show that NCl3 can be easily formed by the reagents called for in the reaction, and can be detonated while still quite wet with the proper activation energy.

NCl3 is practically insoluble in water, and boils at 71C. There's a properties table and some useful tidbits in the link I ran across below.
https://books.google.com/books?id=Q4RvmAri4jcC&pg=PA1415&lpg=PA1415&dq=disposal+of+ncl3&source=bl&otsCh1KzggW#v=onepage&q=ncl3&f=false

While it probably CAN be hydrolyzed to hypochlorous acid and ammonia, this would require heating an unstable explosive that may have already begun to precipitate (insoluble yellow oil) in your flask, and it's going to be an equilibrium that needs to be driven forward by stripping chlorine out, it is far from irreversible. I'd also be concerned about the potential for steam distillation well below its BP, it has a fairly high vapor pressure (80 torr @ 0 C) so a hot (~50-60C) aqueous solution could result in it being deposited in places other than within your flask. It is a potent lachrymator, so this would be undesirable for more than potential detonation reasons.

I'm not saying this synthesis will always, or even infrequently result in some kind of dangerous accident. But I disagree with your evaluation of the risk of NCl3 formation being negligible.

On another note, you specifically mention boiling all your solutions to dryness. NCl3 is a volatile liquid, and insoluble in aqueous solution. I'm inclined to believe that any NCl3 you had created was stripped off well before you reached dryness. Or possibly even the boiling point of water.

I'd also like to point out that the reason nitrogen halides get such a bad rep is because they are *unpredictable*. If there's a minor change in conditions from the runs that didn't have any problems, or some idiot newbee tries to "optimize" without knowing what they're doing, etc, you could very well have a serious accident on your hands.

How did you ventilate when you did this? And what kind of scale? I think these are important details for anyone who'd like to live to replicate your results. *Not that I'd ever recommend doing this*, but free will and stuff I guess.

« *Last Edit: October 02, 2015, 08:30:22 AM by unlikely_username* » Report to moderator

Logged

d00d

Founding Wasp

Posts: 719

Forum Moron

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #173 on:** October 02, 2015, 03:07:19 PM »

Hmm..... I would have just thought it was the rapid expansion of Cl(g) from adding TCCA to nh3 soln. Rapid deprotonation, such as if one was to pour HCl FAST onto aq. nh3 (extremely rapidly expanding gas, which is what an explosion is)

Not sure, but the danger is nonexistent if the TCCA is added slowly and stirred. No NCl3 forms, the doctor has distilled to dryness his reaction mixture twice in a mixture of fear and unrelenting curiosity. The doctor has performed half a dozen of this method of nitrile preparation, no dangers whatsoever yet. On scale that varies from micro to nearly macro (use your imagination)

The reaction is a complex one, it proceeds through 3-4 intermediaries depending on your substrate. The addition of tcca/dcca should only proceed once the aldimine (pink) is formed, while stirring heavily. Perhaps this has something to do with the lack of Cl ions which would be needed IN EXCESS (3xCl for every N) Also the reaction only proceeds in the absence of HCl/Cl ions IIRC

If the reaction is done AS THE PAPER SUGGESTS (45x molar excess of NH3) then the danger is redundant (when adding TCCA/DCCA SLOWLY to a stirring excess) All the Cl ions are obviously used in the formation of the chloroaldimine intermediary (IIRC) or expunged as gas immediately upon addition to the stirred aldimine soln. The nitrile only forms in ABSENCE of Cl, whereas a 3x excess would be necessary to form NCl3 (approx 135x molar to substrate, or 3-4x molar of NH3 lol). Big difference between NONE, and a 135x molar excess. Kind-of hard to fuck that up

Perhaps the heating to 60C post addition is also a hazard mitigation step as much as it is necessary to form the nitrile. There is a danger of choking Cl gas forming upon tcca addition that is too quick, that's about it (not a big deal, easy to handle, just scale your additions properly).

But hey, don't take the doctors word for it. He speaks the truth, and gives a fuck not if you prefer to hypothesize rather than undertake. He has performed nearly all of the common procedures, and the DMSO one-pot with 25% chance of soyuz rocket was the only one he had any dangerous situations with, and he is a stickler for safety procedure.

« *Last Edit: October 02, 2015, 03:38:50 PM by d00d00d00* » Report to moderator Logged

Greater knowledge through stupidity

Burgi-Dunit-Again

Subordinate Wasp

Posts: 176

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

« **Reply #174 on:** October 02, 2015, 07:05:22 PM »

Quote

I think NCl3 itself decomposes in high pH solutions back to chlorate and ammonia.. It's pretty likely that it is just being decomposed as quickly as it is formed so long as the addition is slow, with the chlorination of the imine dragging the equilibrium to the right.

As the paper rightfully states: the danger is in rapid addition of T/DCCA

Report to moderator Logged

tyronious

Larvae

Posts: 10

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

« **Reply #175 on:** October 02, 2015, 09:33:54 PM »

Quote

Adding TCCA slowly to mitigate all safety risks in your opinion seems like kind of s ridiculous assumption especially coming from someone whos been such a stickler about safety of the hydroxylamine method. Slowly basify, receive predictable exothermia, all of the slight excess of hydroxylamine has been decomposed. Also calculations where shown, it wouldnt be the end of the world if all the base was added at once.

Anyways im so over this petty argument about safety. Shouldnt really be an issue if you know what you are doing or are making NCl3 lol. Ammonia as opposed to hydroxylamine would be great as its more OTC. However lets talk more about procedure, reproducibility, yield and purity. Many other bees have posted similiar results and optimizations of the hydroxylamine route. Hows

your yield, purity, reproducibility, and on what scale?

Quote from: d00d00d00 on October 02, 2015, 03:07:19 PM

> Hmm..... I would have just thought it was the rapid expansion of Cl(g) from adding TCCA to nh3 soln. Rapid deprotonation, such as if one was to pour HCl FAST onto aq. nh3 (extremely rapidly expanding gas, which is what an explosion is)
>
> Not sure, but the danger is nonexistent if the TCCA is added slowly and stirred. No NCl3 forms, the doctor has distilled to dryness his reaction mixture twice in a mixture of fear and unrelenting curiosity. The doctor has performed half a dozen of this method of nitrile preparation, no dangers whatsoever yet. On scale that varies from micro to nearly macro (use your imagination)
>
> The reaction is a complex one, it proceeds through 3-4 intermediaries depending on your substrate. The addition of tcca/dcca should only proceed once the aldimine (pink) is formed, while stirring heavily. Perhaps this has something to do with the lack of Cl ions which would be needed IN EXCESS (3xCl for every N) Also the reaction only proceeds in the absence of HCl/Cl ions IIRC
>
> **If the reaction is done AS THE PAPER SUGGESTS (45x molar excess of NH3) then the danger is redundant (when adding TCCA/DCCA SLOWLY to a stirring excess) All the Cl ions are obviously used in the formation of the chloroaldimine intermediary (IIRC) or expunged as gas immediately upon addition to the stirred aldimine soln. The nitrile only forms in ABSENCE of Cl, whereas a 3x excess would be necessary to form NCl3 (approx 135x molar to substrate, or 3-4x molar of NH3 lol). Big difference between NONE, and a 135x molar excess. Kind-of hard to fuck that up**
>
> Perhaps the heating to 60C post addition is also a hazard mitigation step as much as it is necessary to form the nitrile. There is a danger of choking Cl gas forming upon tcca addition that is too quick, that's about it (not a big deal, easy to handle, just scale your additions properly).
>
> But hey, don't take the doctors word for it. He speaks the truth, and gives a fuck not if you prefer to hypothesize rather than undertake. He has performed nearly all of the common procedures, and the DMSO one-pot with 25% chance of soyuz rocket was the only one he had any dangerous situations with, and he is a stickler for safety procedure.

Report to moderator Logged

d00d

Founding Wasp

Posts: 719

Forum Moron

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #176 on:** October 03, 2015, 02:44:40 AM »

Quote from: tyronious on October 02, 2015, 09:33:54 PM

> Adding TCCA slowly to mitigate all safety risks in your opinion seems like kind of s ridiculous assumption especially coming from someone whos been such a stickler about safety of the hydroxylamine method. Slowly basify, receive predictable exothermia, all of the slight excess of hydroxylamine has been decomposed. Also calculations where shown, it wouldnt be the end of the world if all the base was added at once.
>
> Anyways im so over this petty argument about safety. Shouldnt really be an issue if you know what you are doing or are making NCl3 lol. Ammonia as opposed to hydroxylamine would be great as its more OTC. However lets talk more about procedure, reproducibility, yield and purity. Many other bees have posted similiar results and optimizations of the hydroxylamine route. Hows your yield, purity, reproducibility, and on what scale?

Quote from: d00d00d00 on October 02, 2015, 03:07:19 PM

> Hmm..... I would have just thought it was the rapid expansion of Cl(g) from adding

> TCCA to nh3 soln. Rapid deprotonation, such as if one was to pour HCl FAST onto aq. nh3 (extremely rapidly expanding gas, which is what an explosion is)
>
> Not sure, but the danger is nonexistent if the TCCA is added slowly and stirred. No NCl3 forms, the doctor has distilled to dryness his reaction mixture twice in a mixture of fear and unrelenting curiosity. The doctor has performed half a dozen of this method of nitrile preparation, no dangers whatsoever yet. On scale that varies from micro to nearly macro (use your imagination)
>
> The reaction is a complex one, it proceeds through 3-4 intermediaries depending on your substrate. The addition of tcca/dcca should only proceed once the aldimine (pink) is formed, while stirring heavily. Perhaps this has something to do with the lack of Cl ions which would be needed IN EXCESS (3xCl for every N) Also the reaction only proceeds in the absence of HCl/Cl ions IIRC
>
> **If the reaction is done AS THE PAPER SUGGESTS (45x molar excess of NH3) then the danger is redundant (when adding TCCA/DCCA SLOWLY to a stirring excess) All the Cl ions are obviously used in the formation of the chloroaldimine intermediary (IIRC) or expunged as gas immediately upon addition to the stirred aldimine soln. The nitrile only forms in ABSENCE of Cl, whereas a 3x excess would be necessary to form NCl3 (approx 135x molar to substrate, or 3-4x molar of NH3 lol). Big difference between NONE, and a 135x molar excess. Kind-of hard to fuck that up**
>
> Perhaps the heating to 60C post addition is also a hazard mitigation step as much as it is necessary to form the nitrile. There is a danger of choking Cl gas forming upon tcca addition that is too quick, that's about it (not a big deal, easy to handle, just scale your additions properly).
>
> But hey, don't take the doctors word for it. He speaks the truth, and gives a fuck not if you prefer to hypothesize rather than undertake. He has performed nearly all of the common procedures, and the DMSO one-pot with 25% chance of soyuz rocket was the only one he had any dangerous situations with, and he is a stickler for safety procedure.

I guess I sound like I'm overreacting, my bad if I am. It's no big deal, just seemed strange to me that people are constantly having runaway reactions when there are better alternatives, safer ones.

IDK, hydroxylamine much more unpredictable in this case, as it wasn't even known to be the culprit until ones started isolating the nitrile. Basically 0/6 dangerous runs for the NH3/TCCA, 1/1 for DMSO/NH2O2 (while being careful as all hell), don't really give a fuck either way, to each their own said the blind man as he kissed the cow.

As far as yield/scale bragging, the doctor doesn't do that online. Try it yourself, and report. His substrate may differ from yours (haha)

« *Last Edit: October 03, 2015, 02:47:30 AM by d00d00d00* » Report to moderator Logged

Greater knowledge through stupidity

tyronious

Larvae

Posts: 10

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #177 on:** October 06, 2015, 07:07:05 PM »

Hardly bragging, this is the internet and everything should be taken with a grain of salt. However the goal is to increase clandestine synthesis knowledge and to optimize the route from a specific precursor. So it would be quite helpful to grow knowledge in the area if one were to share procedure and alleged yield/purity/other important information.

Report to moderator Logged

Tatewari
Novice Alchemist
Larvae

Posts: 10

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #178 on:** October 08, 2015, 05:05:28 PM »

So which is more dangerous the hydroxylamine one pot or the NH3/TCCA?

Report to moderator Logged

A master of transmutation, the alchemist can alter nature at whim.

pyrrolidin
Subordinate Wasp

Posts: 121

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #179 on:** October 08, 2015, 08:25:04 PM »

Quote from: Tatewari on October 08, 2015, 05:05:28 PM

> So which is more dangerous the hydroxylamine one pot or the NH3/TCCA?

Both are absolutely controllable. Compared to other clandestine synths the risks are negligible.

Report to moderator Logged

P!ssedSc!ent!st
Subordinate Wasp

Posts: 100

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #180 on:** October 09, 2015, 02:54:21 AM »

it is igors experience that the 1-pot DMSO method is fine. yield at least 30%, 70%@best [when using the recently suggested tweaks]. however, after finally isolating the nitrile - i found out where thfucked up garlic cock fart smell is coming from. good ol red-goo ass nitrile. - it was learned that, ahem - FUCKING GREAT AMIDE YIELD CAN BE OBTAINED IF YOU JUST ISOLATE THE FUCKING NITRILE. I GOT CRUDE 94.4 gs Nitrile and waiting on the 80-90gs amide to dry now - from 100g h3|!0NN@| ITS WORTH THE EXTRA STEP+DISTILLATION if not for the yield - but because the amide product from the isolated nitrile came out nearly WHITE. i washed 3 times with cold h20 on the buchner and rextallized one time from h20 and poured over dh20 ice to instantly yield blinding white starry shards.

Report to moderator Logged

Scarecrow
Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #181 on:** November 16, 2015, 05:32:55 PM »

You can get 90% yields without isolating the nitrile. Add your aldehyde, hydroxylamine, in DMSO, heat at 95-100* for 1.5 hours. Cool it, basify with 20%NaOH, basify your H2O2 with aqueous NaOH until its ph 6-7. Slowly add your H2O2, keeping temp around 70-80 and if it gets to 90-95 add it to ice. Make sure you use equimolar hydroxylamine to aldehyde as excess

hydroxylamine will cause exothermia. Let it stir overnight, you should be left with crystals in the flask whih can be vacuum filtered.

Report to moderator Logged

It's a war on personal freedom, that's what it is.

unlikely_username
Subordinate Wasp
Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #182 on:** November 16, 2015, 08:39:55 PM »

Quote from: Scarecrow on November 16, 2015, 05:32:55 PM

> You can get 90% yields without isolating the nitrile. Add your aldehyde, hydroxylamine, in DMSO, heat at 95-100* for 1.5 hours. Cool it, basify with 20%NaOH, basify your H2O2 with aqueous NaOH until its ph 6-7. Slowly add your H2O2, keeping temp around 70-80 and if it gets to 90-95 add it to ice. Make sure you use equimolar hydroxylamine to aldehyde as excess hydroxylamine will cause exothermia. Let it stir overnight, you should be left with crystals in the flask whih can be vacuum filtered.

I'd make some minor comments here, heat to 85-90 *C, 95-100 is possibly excessive and leads to side reactions if you let the bit of exothermia during the dehydration surprise you and kick the temp way up. The 1.5 hour reaction time was selected to compensate for the slightly decreased temperature and because the reaction was being performed on the 100g scale, where an extra couple percent yield makes a more significant difference.
With the basification of H2O2 pH 6-8 should be good, just want to mostly neutralize the acid buffers while making sure you don't go crazy with the basification. Do this close to the time you intend on using the peroxide and don't try and store a pre-basified solution, basic peroxide readily degrades on it's own.
The importance of having a cold bath of some sort ready really can't be stressed enough. If you're not careful and things start getting out of hand it means the difference between a minor scare and a failed reaction + huge mess.

Report to moderator Logged

thewire
Dominant Wasp
Posts: 426

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #183 on:** November 29, 2015, 10:31:20 AM »

Process for the conversion of aldehydes into nitriles using ammonia and hydrogen peroxide
EP 1212294 A1

A new effcient method for the conversion of aldehydes into nitriles using ammonia and hydrogen peroxide

Tetrahedron Letters 41 (2000) 6749-6752

A Catalytic Synthesis of Nitriles from Aldehydes and Alcohols in the Presence of Aqueous Ammonia by Oxidation with NiSO4–K2S2O8
Shigekazu Yamazaki1), Yasuyuki Yamazaki1)

Chemistry Letters
Vol. 19 (1990) No. 4 P 571-574

A Simple and One-pot Oxidative Conversion of Alcohols or Aldehydes to the Nitriles using NaIO4/KI in Aqueous NH3

Bull. Korean Chem. Soc. 2011, Vol. 32, No. 12 4191

Direct Synthesis of Nitriles from Alcohols or Aldehydes Using H5IO6/KI in Aqueous Ammonia

Synthetic Communications: An International Journal for Rapid Communication of Synthetic
Organic Chemistry, 43:1, 52-58

WO0117949A1.pdf (1004.17 kB - downloaded 85 times.)
Nitrile, Sodium periodate, Ammonia, Potassium iodide.pdf (243.02 kB - downloaded 64 times.)
CL Vol. 19 (1990) No. 4 P 571-574.pdf (71.75 kB - downloaded 51 times.)
10.1016@s0040-4039(00)01168-0.pdf (140.58 kB - downloaded 48 times.)
10.1080@00397911.2011.591035.pdf (353.52 kB - downloaded 48 times.)

Report to moderator Logged

thewire
Dominant Wasp
Posts: 426

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #184 on:** November 29, 2015, 04:06:23 PM »

Quote

Metal-free one-pot oxidative conversion of benzylic alcohols and benzylic halides into aromatic amides with molecular iodine in aq ammonia, and hydrogen peroxide

Ryosuke Ohmura, Misato Takahata, Hideo Togo

Tetrahedron Letters 51 (2010) 4378–4381

Various primary alcohols , particularly benzylic alcohols, could be converted into the corresponding aromatic amides in good yields in a one-pot manner by treatment with molecular iodine in aq. NH3, followedby reaction with 30% aq H2O2. Similarly, various benzylic halides could be also converted into the corresponding aromatic amides in good yields in a one-pot manner by treatment with molecular iodine in aq NH3, followed by reaction with30% aq H2O2. The present reactions involve the metal-free one-pot oxidative conversion of benzylic alcohols and benzylic halides into the corresponding aromatic amides,
respectively.

Typical procedure for the preparation of aromatic amides from benzylic alcohols:
To a mixture of 4-methylbenzyl alcohol (122.2 mg, 1.0 mmol) and aq NH3 (3 mL, ca. 28%) was added I2(761.4 mg, 3 mmol) at rt under empty balloon. The
mixture was stirred for 2 h at 60°C. Then, the reaction mixture was cooled to

0°C, aq NH3(10 mL)
was added again to the mixture, and aq H2O2(10 mL, ca. 30%) was slowly added to the reaction mixture
via a dropping funnel. After thereaction mixture was stirred for 2 h at rt, it was poured into aq satd. Na2SO3 (3 mL)
and was extracted with CHCl3 (20 mLx3). The organic layer was washed with brine and dried over Na2SO4.After removal of the solvent, 4-methylbenzamide was obtained in 91% yield in an almost pure state. If necessary, the amide was purified by flash column chromatography on silica gel (eluent: AcOEt) as a colorless solid.

This procedure works with aldehydes as well, because the reaction pathway goes
through aldehyde formation (scheme 1.).

http://www.cs.gordon.edu/~ijl/_lead_papers/Metal-free%20one-pot%20oxidative%20conversion%20of%20benzylic%20alcohols%20and%20benzyl

This procedure in not suitable for large scale procuction. Due to the formation of of the explosive nitrogen triidode - ammonia complex from iodine and aqueous ammonia under certain conditions.
https://books.google.co.uk/books?id=cR6GAwAAQBAJ&pg=PA98&lpg=PA98&dq=Science+of+Synthesis:+Houben-Weyl+Methods+of+Molecular++19.5.1.1.1.5&source=bl&ots=cIEHODVC4N&sig=6r Weyl%20Methods%20of%20Molecular%20%2019.5.1.1.1.5&f=false

Metal-free one-pot oxidative conversion of benzylic alcohols and benzylic halides into aromatic amides with molecular iodine in aq ammonia, and hydrogen peroxide.pdf (144.29 kB - downloaded 50 times.)

« *Last Edit: November 29, 2015, 05:03:35 PM by thewire* » Report to moderator Logged

thewire
Dominant Wasp
Posts: 426

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #185 on:** December 02, 2015, 11:20:47 PM »
Quote

Microwave-promoted transformation of nitriles to amides with aqueous sodium perborate

Synthetic Communications 11/2006; 31(3)(3):431-434. DOI: 10.1081/SCC-100000535

ABSTRACT
Microwave irradiation of several aromatic and aliphatic nitriles, including an ?, ?-bistrimethysilylnitrile, with sodium perborate tetrahydrate in a mixture of water/ethanol (2:1), smoothly produced corresponding amide in short times and with high yields. Other functional groups, such as aldehyde, are unaffected under these conditions.

10.1081@SCC-100000535 Microwave-promoted transformation of nitriles to amides with aqueous sodium perborate.pdf (120.43 kB - downloaded 82 times.)

Report to moderator Logged

pyrrolidin
Subordinate Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
Quote

Posts: 121

« **Reply #186 on:** December 03, 2015, 05:24:06 PM »

Quote from: thewire on December 02, 2015, 11:20:47 PM

> Microwave-promoted transformation of nitriles to amides with aqueous sodium perborate
>
> Synthetic Communications 11/2006; 31(3)(3):431-434. DOI: 10.1081/SCC-100000535
>
> **ABSTRACT**
> *Microwave irradiation of several aromatic and aliphatic nitriles, including an ?, ?-bistrimethysilylnitrile, with sodium perborate tetrahydrate in a mixture of water/ethanol (2:1), smoothly produced corresponding amide in short times and with high yields. Other functional groups, such as aldehyde, are unaffected under these conditions.*

This looks really nice. If a C/O-TMS bond survives that indicates that the conditions are very mild. Also: "A domestic Moulinex microwave oven (Micro-Chef□, 900 W,
2450 MHz) was used for the irradiation of the samples."
This is very important and ensures that regular wattage microwaves can be used, this is often not the case.

Nice find, this could push the yields of aldehyde -> amide even a bit further than with the one-pot and could eliminate the dangerous step in this synthesis. Did anyone isolate the nitrile, and if so in what yield? I noticed that at the nitrile stage 3 products had formed, 1 major probably 90%+ nitrile, but still there is some potential to side reaction, distilling the aldehyde would probably get rid of this.

« *Last Edit: December 03, 2015, 05:26:15 PM by pyrrolidin* » Report to moderator Logged

thewire

Dominant Wasp

Posts: 426

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote

« **Reply #187 on:** December 03, 2015, 09:26:43 PM »

Quote

> Did anyone isolate the nitrile, and if so in what yield?

I do remember someone had managed to isolate the nitrile but I can't find the post now. It was a very short post by the way. Yield wasn't specified only the melting point (if I remember correctly it melts at 113-116 C).

Report to moderator Logged

critmass235

Larvae

Posts: 44

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote

« **Reply #188 on:** December 14, 2015, 05:32:36 AM »

while back some twack out hobo in the woods decided to try the sodium percarbonate version a few times, in MeOH ,acetone, and once in a one pot style. compared to the regular peroxide, it was much easier to control the temperature but other then that the yeilds were terrible(10 grams starting yeilded the best any higher is not worth it).its biggest issue was way too much sodium carbonate. it solubility was in water is to low(thought it was amide for a sec). maybe leaching it into MeOH over time would work.

Report to moderator Logged

P!ssedSc!ent!st
Subordinate Wasp
Posts: 100

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #189 on:** January 14, 2016, 01:22:29 AM »

So

Has anyone else isolated the nice smelling stuff that comes off the amide when its pure?

Igor did, just for fun.

300ml of cloudy yellowish nice smelling amide-washwater was extracted for 20 minutes with stirring by 50ml DCM. DCM removed and dried with MgSO4 for 20 mins with stirring. i did not wash the DCM with water first, just went straight to drying it and then the DCM was evaped in a dish at very low heat, almost none, leaving Piperonal-smelling white-ish powder crystals.

so they were scraped up and some placed in a tiny beaker with a thermometer to make a crude MP device, since it smelled like piperonal, and that shit is valuable, and everyone including igor has prolly benn tossing it, the melting point test was done: melting began around 36*C and the entire mass of crystals was melted at 38*C.
which is the same mp as Piperonal.
im going to do some solubility tests on whats left and see what i come up with and report back.

Report to moderator Logged

unlikely_username
Subordinate Wasp
Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #190 on:** January 14, 2016, 05:05:16 AM »

I'm not certain how piperonal would be formed, but if you want to test it, see if you can form the bisulfite adduct. Should be a definitive test, especially for a benzaldehyde.
Personally, I don't think the amide and piperonal smell similar, and I have some of each of them laying around atm. Report back with your findings of course.

Report to moderator Logged

P!ssedSc!ent!st
Subordinate Wasp
Posts: 100

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #191 on:** January 14, 2016, 09:12:26 AM »

me either, ive been looking into the reaction specifics and byproducts but my knowledge and understanding of what im reading is lacking... i cant see how it could oxidize the nitrile all the way to the benzylic aldehyde, but then again idk about all the wonder of DMSO and its crazy complexes.

i tried twice to get a bisulfite adduct to no avail. accidentally vaporised all the sample before i could add the bisulfite soln.

all i know is it definitely leaves that marshmellowy aftertaste in my mouth - the only thing that does that, is piperonal - for me personally. and melts @ piperonals MP.

SOMEONE FIND OUT WHAT THIS IS

Report to moderator Logged

critmass235
Larvae
Posts: 44

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #192 on:** January 14, 2016, 12:40:37 PM »

Quote

my guess is the COOH ester(always used MeOH). the peroxide step already wants to jump passed the amide. and most people are using MeOH. who knows

Report to moderator Logged

P!ssedSc!ent!st
Subordinate Wasp
Posts: 100

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #193 on:** January 17, 2016, 07:17:28 PM »

Quote

but you get the wonderful smell even if you dont use methanol.

Report to moderator Logged

critmass235
Larvae
Posts: 44

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #194 on:** January 17, 2016, 08:24:23 PM »

Quote

didnt smell the one time tried with acetone(one of the first times so other factors could have cause it not to), but when its over pushed it gets stronger smelling. more test would be needed , maybe its the COOH acid. it makes sense becauce thats where thats heading(amide to COOH in basic water)

Report to moderator Logged

P!ssedSc!ent!st
Subordinate Wasp
Posts: 100

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #195 on:** January 20, 2016, 08:26:25 PM »

Quote

so CAS 94-53-1 ?

thats interesting. id love to see drawings of how that reaction might take place. i guess the heat drives the mixture to want to chop the molecule in half at the beta-carbon [that is the beta carbon right?]

i feel like there has to be some way to manipulate that aspect into something useful...though im not sure what/how lol

Report to moderator Logged

critmass235
Larvae
Posts: 44

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #196 on:** January 21, 2016, 03:33:12 AM »

Quote

isnt that the piperonal carbonic acid(sue me if i got the name wrong) i was thinking the dont speak aldehyde's amide to cooh.. it comes during the peroxide step
http://www.chem.ucalgary.ca/courses/350/Carey5th/Ch20/ch20-3-4-1.html
so replace the nitrogen with a HO. without peroxide thats where it heads based on my research. and since its in a high ph with an alcohol= ester (guessing anyhow, but on hindsight too much water for fisher ester right?). im guessing the decarb to ketone is what you could do with it. didn't someone play with that already? see if it smells the same.

Report to moderator Logged

Scarecrow

Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #197 on:** May 05, 2016, 04:22:00 PM »

So for anyone having problems with this reaction still I may have the solution. Ive been running this recently, and by using electric pH/temp I have been able to nail down the dynamics of this reaction.

Essentially, for base catalysed conversion of the nitrile to the amide with hydrogen peroxide, aka the second part of this process, this reaction only occurs at 65*+ and at a pH of above 8 (10 is the highest reaction rate). The addition of H2O2 to the reaction lowers the pH, so the pH must constantly be adjusted back into the pH range of 8-10 to kick the reaction back in. You want to keep the temp between 85-95 for most of the addition. It may require cooling.

I run it like this, after stirring my Helional/Hydroxylamine/DMSO (5:1 solvent ratio) at 85* for 90 minutes, i add 10-15% NaOH solution until pH 10 (around 120-200ml) and try and keep the temp around 70. Then start your H2O2 addition only if the temp is around 70 (above 60-65), as you drip your H2O2 in the reaction will start (you will see gas evolution), but the pH will begin to decrease. Monitor your pH, and when the pH hits 8, stop your H2O2 addition, and basify to pH 10. This will cause ALOT of gas evolution, monitor your temps to make sure you dont get over 100*. Now you can start your H2O2 addition. When the pH gets to 8 again, you stop your H2O2 addition and basify back to pH 10, rinse and repeat until you have added about 70ml of H2O2 for every 10g of amide. This should result in a yellow solution. Maintain stirring until gas evolution/exothermia has ceased.

Report to moderator Logged

It's a war on personal freedom, that's what it is.

thewire

Dominant Wasp

Posts: 426

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #198 on:** May 05, 2016, 07:37:41 PM »

Quote from: Scarecrow on May 05, 2016, 04:22:00 PM

> So for anyone having problems with this reaction still I may have the solution. Ive been running this recently, and by using electric pH/temp I have been able to nail down the dynamics of this reaction.
>
> Essentially, for base catalysed conversion of the nitrile to the amide with hydrogen peroxide,

aka the second part of this process, this reaction only occurs at 65*+ and at a pH of above 8 (10 is the highest reaction rate). The addition of H2O2 to the reaction lowers the pH, so the pH must constantly be adjusted back into the pH range of 8-10 to kick the reaction back in. You want to keep the temp between 85-95 for most of the addition. It may require cooling.

I run it like this, after stirring my Helional/Hydroxylamine/DMSO (5:1 solvent ratio) at 85* for 90 minutes, i add 10-15% NaOH solution until pH 10 (around 120-200ml) and try and keep the temp around 70. Then start your H2O2 addition only if the temp is around 70 (above 60-65), as you drip your H2O2 in the reaction will start (you will see gas evolution), but the pH will begin to decrease. Monitor your pH, and when the pH hits 8, stop your H2O2 addition, and basify to pH 10. This will cause ALOT of gas evolution, monitor your temps to make sure you dont get over 100*. Now you can start your H2O2 addition. When the pH gets to 8 again, you stop your H2O2 addition and basify back to pH 10, rinse and repeat until you have added about 70ml of H2O2 for every 10g of amide. This should result in a yellow solution. Maintain stirring until gas evolution/exothermia has ceased.

Great work!

Report to moderator Logged

Antlerchem

Larvae

Posts: 8

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #199 on:** June 02, 2016, 05:05:47 PM »

Exelent information scarecrow
Only I have doubt
You say 5:1 solvent ratio

I have undertood helional and hidroxylamine hcl use in equimolar ratio, i'm right?

So 5 ratio is solvent or helional/hidroxylamine

Thank you
Really I appreciate your feadback

Actually I work with tradicional route oxime>amide>amine but i do not want use toluene

Report to moderator Logged

Scarecrow

Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #200 on:** June 02, 2016, 09:05:39 PM »

Quote

Exelent information scarecrow
Only I have doubt
You say 5:1 solvent ratio

I have undertood helional and hidroxylamine hcl use in equimolar ratio, i'm right?

So 5 ratio is solvent or helional/hidroxylamine

Thank you
Really I appreciate your feadback

Actually I work with tradicional route oxime>amide>amine but i do not want use toluene

500ml DMSO, 100g Aldehyde, 36.XXg Hydroxylamine

« *Last Edit: June 02, 2016, 09:11:00 PM by Scarecrow* » Report to moderator Logged

It's a war on personal freedom, that's what it is.

Antlerchem

Larvae

Posts: 8

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote

« **Reply #201 on:** June 03, 2016, 12:20:10 AM »

Thank you scarecrow

Other cuestion
How much its posible scale up this reaction?
I see that using equimolar aldehyde/hidroxilamine its safe this reaction
Or which it is the risk of scale up

Thanks.

Report to moderator Logged

magoo

Perpetual Bumblefuck
Larvae

Posts: 27

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote

« **Reply #202 on:** June 11, 2016, 02:43:24 AM »

Does anybee have any recommendations for the Neat Cu(II) Catalysed amidation of aldehydes?
Is it safe to scale up from ~1mmol?

« *Last Edit: June 23, 2016, 08:07:22 AM by magoo* » Report to moderator Logged

magoo

Perpetual Bumblefuck
Larvae

Posts: 27

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote

« **Reply #203 on:** June 23, 2016, 08:08:27 AM »

Okay this procedure has been performed as described in *"An efficient copper (II)-catalyzed direct access to primary amides from aldehydes under neat conditions" Tetrahedron letters 53 (2012) 1413-1416* sans the Ethyl Acetate extraction and at 50x scale.

procedure:
0.5mol aldehyde**(1)**
0.5mol $NH_2OH.HCl$**(2)**
0.55mol Na_2CO_3**(3)**
0.025mol $CuSO_4$**(4)**

-In a 500ml beaker **(1)** was added to an intimate mixture of **(2)**,**(3)**,**(4)** resulting in mild exothermia and effervescence, which almost caused the reaction mixture to overflow.

-It was placed in an oil bath, heated to 110^oC with manual stirring, and kept

there for 2hrs.
-The beaker was removed from the oil bath and allowed to cool. However at this point the reaction was abandoned for almost 24hrs.
-Upon return to the lab there was noted fine white 'hairs' that looked to be growing on the surface of a very dark green, hard waxy solid in the beaker that looked like akin to mould growing on molten crayola.. 'forrest green' to be exact.
-The beaker was returned to the oil bath to melt the solid (and free the glass stir rod)
-Whilst warm this was dissolved in ~700ml of acetone and then left to settle.
-The organic layer was poured into 1000ml cold dH_2O, resulting in the precipitation of a voluminous mass of fine fluffy crystals. This was then left so as to allow it to cool and let some acetone evaporate off.
-This was then filtered and washed with dH_2O, and dried under vacuum, leaving sparkly, off-white almost pastel mint product. Final weight will be posted when bone dry.

Notes:
-This was not monitored by TLC (due to inability to do so)
-The reaction starts out quite viscous and gets even moreso. The use of overhead stirring is suggested.
-The effervescence might be caused by the fact that the heldehyde had not been distilled prior to use, or perhaps because neither the $CuSO_4$ or Na_2CO_3 was anhydrous.
-The final yield will be lower than it should have been, as i used a small ~1g sample and tried, in vain, to use the typical workup for the nickel acetate beckmann rearrangement i.e. dumping into water when done.

Is there a simple method to separate oxime from amide?

« *Last Edit: June 23, 2016, 12:27:36 PM by magoo* »

Report to moderator Logged

wipadky

Larvae

Posts: 5

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

« **Reply #204 on:** August 22, 2016, 06:41:41 PM »

Quote

I did the reaction twice now, with the DMSO hydroxylamine method, heating it for 3h @ 90C and then basifying to pH 9-10 (pH measured with pH measuring device).

First time I then proceeded with addition of H2O2 30% under noticable exothermia. The pH was continuously adjusted to within a range of 8-10. At some point an ice bath was necessary to keep the reaction below 100C. An oil had formed on the bottom of my reaction mixture, dark amber in color. I took it out and placed in a separate flask with some DMSO and put it in the fridge where it solidified to a waxy substance. The other flask was left in the fridge to crystalize o/n and a white precipitate had formed. However upon probing it with a spatula the crystals seemed to be made of the same waxy substance and compacted very easily.

Second time I basified to pH 9.8 and proceeded with the addition of H2O2 as before, correcting pH as needed, however almost no exothermia was noted this time. At some point the temperature dropped below 60C and the H2O2 was all added so I proceeded to gently heat the reaction in an oil bath. The temperature rose steadily up to about 71C and with the rising of the temperature the pH dropped, for which I carefully corrected. I soon came to regret this because soyuz.. It took me by surprise, luckily the mess wasn't that

bad. I left the whole mess overnight and next day crystals had formed in what was left of my reaction flask - white, fluffy sparkly crystals that weren't waxy at all, so I have high hopes that this is my amide.

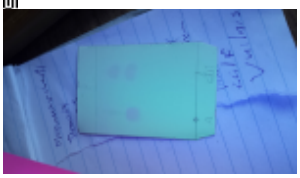
I put the crystals on TLC in comparison with the waxy crystals and they seem to also contain the finished product - assuming the white crystals are the amide.

My apologies for my terrible spotting skills, I'm still learning. I also made a (too small) TLC with (from left to right) the aldehyde, suspected amide, suspected nitrile, the dmso containing the waxy suspected nitrile and a cospot of all four. I know, it's a terrible TLC and I'll try to make a better one. The first TLC was first with UV and then stained with ninhdrin and the second one was only stained with ninhydrin (didn't take a picture of the UV). All ninhydrin stainings were after heating. On the ones on the hotplate, the first is after gentle heating (50C) and the second after agressive heating (250C).

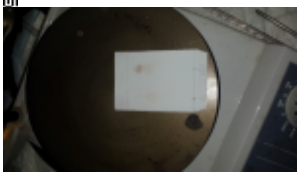
What puzzles me is that the ninhydrin stains everything. I was under the impression that it would only stain primary and secondary amines with a blue stain and amides with an orange stain after heating, so I'm not sure what to make of this staining. Unfortunately I don't have any DNP so I can't test for aldehydes specifically.

I assume that the waxy stuff is a mixture of amide and unhydrolised nitrile. Is there any non-negligable risk to the amide if I expose it to more H2O2? Otherwise I could maybe separate it by removing the waxy oil by heating, dissolving hopefully most of the amide which can then be recovered by filtration. But then how would I proceed with the nitrile hydrolysis of the waxy crap? I'm new here, so any advice is appreciated. Thank you!

2016-08-22 18.55.34.jpg (779 kB, 3264x1836 - viewed 121 times.)



2016-08-22 18.54.24.jpg (696.75 kB, 3264x1836 - viewed 96 times.)



2016-08-22 19.10.10.jpg (607.88 kB, 3264x1836 - viewed 84 times.)

2016-08-22 19.10.51.jpg (818.46 kB, 3264x1836 - viewed 99 times.)

Report to moderator Logged

wipadky

Larvae

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

Posts: 5

« **Reply #205 on:** August 22, 2016, 08:25:00 PM »

I made some better TLC's, see the attached images. Spotting from left to right: Helional, "amide", "nitrile", supernatant of waxy stuff in DMSO

First image is spots under UV, second is the spots under UV circled with pencil - I can't make a very nice photo from the UV lighted plates. Third image is iodine vapor chamber, fourth image is ninhydrin staining with gentle heating (~70C) and fifth is ninhydrin with hotplate on full nuke. The last image is a the second-last tlc compared to one with a KMnO4 stain, unfortunately I think I was a little enthousiastic in heating up the stain in the top left so there's some bleaching. I don't know why the bottom of the KMnO4 one is also showing a reaction. Could this be because I reused the solvent for the TLC?

I read in a post by pyrrolidin that she did the reaction with the H2O2 completely in an ice bath so I was wondering, is this also a viable way to produce the amide? I'm not well versed in NMR so I couldn't interpret the accompanying spectrogram.

Edit: Oh yeah, for the TLC solvents I went for 1:1 DCM acetone

2016-08-22-21.06.45.jpg (66.8 kB, 551x980 - viewed 112 times.)

2016-08-22-21.08.23.jpg (62.15 kB, 551x980 - viewed 93 times.)

2016-08-22-21.16.32.jpg (83.81 kB, 551x980 - viewed 90 times.)

2016-08-22-21.25.58.jpg (35.61 kB, 551x980 - viewed 87 times.)

2016-08-22-21.27.50.jpg (53.52 kB, 551x980 - viewed 89 times.)

2016-08-22-21.30.00.jpg (61.68 kB, 551x980 - viewed 111 times.)

« *Last Edit: August 23, 2016, 12:12:18 PM by wipadky* »

Report to moderator Logged

byko3y

Subordinate Wasp

Posts: 167

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #206 on:** August 22, 2016, 09:48:02 PM »

You did not mention the solvent used for TLC. Most likely it will be the answer on about why the bottom of the plate is stained.
(Now answering to your update: indeed, staining at the bottom is most likely caused by some contamination of solvent).
Yellow-orange is a color of ninhydrin imine salt. However, I have no idea why this shit stains everything - it shouldn't. Well, from my experience I can say that ninhydrine can give a false-positive on the whole plate if the plate was sprayed with a simple sodium acetate. Buffering the ninhydrine solution to ph=5 is a good idea. Another good idea is to carefully control heating, so ninhydrin will not decompose.
Judging by the sides of your TLC, which are red because of amino acids from your skin, I could guess that all the colors on the TLC are weak, except, maybe, a far red spot of nitrile, which might be a hydroxylamine in fact.

Report to moderator Logged

wipadky

Larvae

Posts: 5

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #207 on:** August 23, 2016, 12:17:33 AM »

Thanks for the tip, I will adjust the pH of the ninhydrin stain. As you probably have guessed I'm pretty new at TLC. Are there any other stains that could be useful in this particular synthesis? (Other than DNP, I ordered it but it somehow went return to sender..) I'm very interested in this technique. Although perhaps this is not the topic to discuss TLC at length.

Report to moderator Logged

Re: FACILE ONE-POT CONVERSION

Quote

byko3y
Subordinate Wasp
Posts: 167

OF ALDEHYDES INTO AMIDES results

« **Reply #208 on:** August 23, 2016, 01:35:53 AM »

Iodine, vanillin, molybdate, cerric(IV) salt. Hydroxylamine+FeCl3 works for amides and nitriles, but you might have hydroxylamine in your mixture (not sure whether that can interfere).

Report to moderator Logged

wipadky
Larvae
Posts: 5

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #209 on:** August 23, 2016, 02:39:11 AM »

Cool. I've been a little weary of giving vanillin a try, I heard it produces very nice stains but I can smell it through 3 sealed plastic bags so I'm not sure if I want to open it hehe. I have FeCl3 too so that's worth giving a shot. I have Ammonium cerium (IV) sulphate and ammonium molybdate, those of any use? Ah, and I managed to salvage a little bit of O-dianisidine, and I vaguely remember reading in some google book that it was useful for some alcohols, although googling gets me not much further than sugars.

Just ran another rxn, same conditions again; slight excess of hydroxylamine compared to aldehyde in DMSO, left to react for a good 90 minutes @ 95C, cooled down to 80 degrees on stirrer and basified with 10% NaOH in dH2O to a pH of 9.5 with about .5g bicarb as buffer. When temperature dropped to 60, started adding 30% H2O2 (basified with NaOH to 7.4, added a little EDTA because I remember reading somewhere that EDTA does good things, something about preventing decomposition by metals. (Maybe I screwed up my NaOH by chelating a bunch of sodium?) with a lot of effervescence and exothermia. Kept temperature between 58 and 70 degrees by varying the rate of addition of the H2O2/NaOH and adding cold water to the ice bath or removing it. I thought this was pretty smart of myself but I clearly didn't think it through enough and ended up siphoning half my ice bath on the floor while I was carefully adjusting one of the burettes. Everything done under constant heavy stirring.

When the reaction did not produce any more exothermia/fizzing the beaker was removed from the stirrer and left to settle. Again a significant oily layer formed on the bottom, estimate around 6ml (started with 9.2ml = ~10g helional). I decanted the turbid light tan supernatant from the heavy organic layer and got as much of it as I could without bothering with a sep funnel. I also noticed a slight oily film on top of the mixture. Left this for what it was. I ran a TLC from the bottom organic layer, the middle DMSO/water/? layer and attempted to get a sample from the oily film.

TLC: DMSO:acetone 1:1, from left to right: Top film, bottom layer, "middle" layer. Second picture: Iodine vapor, first picture: Ninhydrin after heating to ~90C (pH is now corrected)

Would it be possible to isolate the oxime/nitrile and use a different solvent system from thereon?

2016-08-23-04.05.jpg (84.58 kB, 551x980 - viewed 91 times.)

2016-08-23-04.06.jpg (84.77 kB, 979x551 - viewed 111 times.)

2016-08-23-03.51.jpg (765.92 kB, 1836x3264 - viewed 93 times.)

« *Last Edit: August 23, 2016, 12:06:02 PM by wipadky* » Report to moderator Logged

byko3y

Subordinate Wasp

Posts: 167

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

« **Reply #210 on:** August 23, 2016, 04:33:08 AM »

Quote

I think the first image is ninhydrin and the last is with iodine vapor. Not much information on both though - two compounds exist in the mixture.
PS: your images are excessively large, shrinking 3-5 times (816x459) will completely preserve the quality. Full backup of the vespiary is 3Gb large for 3 years, your images made in a day are 10 Mb large in total - 1/300 of all the whole site content.

« *Last Edit: August 23, 2016, 04:44:38 AM by byko3y* » Report to moderator Logged

wipadky

Larvae

Posts: 5

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

« **Reply #211 on:** August 23, 2016, 12:03:17 PM »

Quote

Yes, the images got switched when I edited my post I think. Regarding the image size, I didn't even know my phone produced images this large. The lens is much too crappy for that size to make a difference, so I figured it would already be a sensible size. I'll change them. Anyway, still no luck in making pretty crystals, only sticky waxy snowflakes that still smell a lot like aldehyde and are apparently made up of two or more products. Now I came across this in the Hofmann thread:

Quote from: Burgi-Dunit-Again on April 24, 2015, 01:05:41 AM

I know this topic is about the hofmann rearrangement, but since everyone here seems to love theory, what really needs to be done to get this 'propanal of the ocean' controlled as soon as possible is the following:

Find a way to use TCCA / DCCA to get directly from the aldehyde to the nitrile: *Veisi, Hojat. "Direct oxidative conversion of alcohols, amines, aldehydes, and benzyl halides into the corresponding nitriles with trichloroisocyanuric acid in aqueous ammonia." Synthesis 15 (2010): 2631-2635.*

The nitrile is then easily hydrolyzed to the amide in situ with a bit of H2O2, recrystallized from water, and the DCCA used again in the usual manner to form the amine.

So there you have it. Two easy steps, two OTC reagents, and zero solvents.. to turn Uncle Sam's favorite cologne ingredient into the "hip" stimulant of our age.

The pollen's right there, who's going to bee the first to make the honey?

There wasn't really any reaction in the other thread, I was hoping someone has maybe tried this. My main concern is generating NCl3 and blowing up my face/house, or is there only the one route for the Cl from the TCCA; being liberated and then expelled as HCl. It seems to me like the risk of doom and disaster is not very high. Maybe someone smarter than me has an opinion on this?

Report to moderator Logged

Scarecrow

Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #212 on:** August 24, 2016, 04:18:48 PM »

Quote from: wipadky on August 23, 2016, 02:39:11 AM

Cool. I've been a little weary of giving vanillin a try, I heard it produces very nice stains but I can smell it through 3 sealed plastic bags so I'm not sure if I want to open it hehe. I have FeCl3 too so that's worth giving a shot. I have Ammonium cerium (IV) sulphate and ammonium molybdate, those of any use? Ah, and I managed to salvage a little bit of O-dianisidine, and I vaguely remember reading in some google book that it was useful for some alcohols, although googling gets me not much further than sugars.

Just ran another rxn, same conditions again; slight excess of hydroxylamine compared to aldehyde in DMSO, left to react for a good 90 minutes @ 95C, cooled down to 80 degrees on stirrer and basified with 10% NaOH in dH2O to a pH of 9.5 with about .5g bicarb as buffer. When temperature dropped to 60, started adding 30% H2O2 (basified with NaOH to 7.4, added a little EDTA because I remember reading somewhere that EDTA does good things, something about preventing decomposition by metals. (Maybe I screwed up my NaOH by chelating a bunch of sodium?) with a lot of effervescence and exothermia. Kept temperature between 58 and 70 degrees by varying the rate of addition of the H2O2/NaOH and adding cold water to the ice bath or removing it. I thought this was pretty smart of myself but I clearly didn't think it through enough and ended up siphoning half my ice bath on the floor while I was carefully adjusting one of the burettes. Everything done under constant heavy stirring.

When the reaction did not produce any more exothermia/fizzing the beaker was removed from the stirrer and left to settle. Again a significant oily layer formed on the bottom, estimate around 6ml (started with 9.2ml = ~10g helional). I decanted the turbid light tan supernatant from the heavy organic layer and got as much of it as I could without bothering with a sep funnel. I also noticed a slight oily film on top of the mixture. Left this for what it was. I ran a TLC from the bottom organic layer, the middle DMSO/water/? layer and attempted to get a sample from the oily film.

TLC: DMSO:acetone 1:1, from left to right: Top film, bottom layer, "middle" layer. Second picture: Iodine vapor, first picture: Ninhydrin after heating to ~90C (pH is now corrected)

Would it be possible to isolate the oxime/nitrile and use a different solvent system from thereon?

You are running your H2O2 addition too cold. If you are basifying your H2O2 dont use any cooling, let the flask sit stirring on its own heat during the addition of basified H2O2 and try keep temp around 80*.
If you start your addition of basified peroxide at around 80* and have a steady drop rate you should not have to touch the reaction in terms of pH or temp if its stirring on its own heat, it might get to 95*+ but as long as your DMSO isnt boiling off and you dont have a huge excess of H2O2 in there (which you shouldnt if you are doing your H2O2 addition at the correct pH) then you should be fine. The souyez rocket generally comes from when you are adding H2O2 that is acidic so it builds up in the flask as its not being used in the reaction...
You dont want to be adding base during your reaction as fluxuating pH will lower your yields and the exothermia will probably cause your reaction to run away. I.e if you have added 150ml of H2O2 out of the correct pH range, then add NaOH bringing it into the correct pH range, you are going to have....
"rapid hydrogen peroxide decomposition"

Report to moderator Logged

It's a war on personal freedom, that's what it is.

FacileAsshole
Larvae

Posts: 2

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #213 on:** September 05, 2016, 12:52:55 AM »

Quote from: wipadky on August 23, 2016, 02:39:11 AM

> Cool. I've been a little weary of giving vanillin a try, I heard it produces very nice stains but I can smell it through 3 sealed plastic bags so I'm not sure if I want to open it hehe. I have FeCl3 too so that's worth giving a shot. I have Ammonium cerium (IV) sulphate and ammonium molybdate, those of any use? Ah, and I managed to salvage a little bit of O-dianisidine, and I vaguely remember reading in some google book that it was useful for some alcohols, although googling gets me not much further than sugars.
>
> Just ran another rxn, same conditions again; slight excess of hydroxylamine compared to aldehyde in DMSO, left to react for a good 90 minutes @ 95C, cooled down to 80 degrees on stirrer and basified with 10% NaOH in dH2O to a pH of 9.5 with about .5g bicarb as buffer. When temperature dropped to 60, started adding 30% H2O2 (basified with NaOH to 7.4, added a little EDTA because I remember reading somewhere that EDTA does good things, something about preventing decomposition by metals. (Maybe I screwed up my NaOH by chelating a bunch of sodium?) with a lot of effervescence and exothermia. Kept temperature between 58 and 70 degrees by varying the rate of addition of the H2O2/NaOH and adding cold water to the ice bath or removing it. I thought this was pretty smart of myself but I clearly didn't think it through enough and ended up siphoning half my ice bath on the floor while I was carefully adjusting one of the burettes. Everything done under constant heavy stirring.
>
> When the reaction did not produce any more exothermia/fizzing the beaker was removed from the stirrer and left to settle. Again a significant oily layer formed on the bottom, estimate around 6ml (started with 9.2ml = ~10g helional). I decanted the turbid light tan supernatant from the heavy organic layer and got as much of it as I could without bothering with a sep funnel. I also noticed a slight oily film on top of the mixture. Left this for what it was. I ran a TLC from the bottom organic layer, the middle DMSO/water/? layer and attempted to get a sample from the oily film.
>
> TLC: DMSO:acetone 1:1, from left to right: Top film, bottom layer, "middle" layer. Second picture: Iodine vapor, first picture: Ninhydrin after heating to ~90C (pH is now corrected)
>
> Would it be possible to isolate the oxime/nitrile and use a different solvent system from thereon?

Everything scarecrow said. + The dark oil you mention sounds like the result of over heating during the nitrile formation. Keep it below 90C, perhaps 85C for only 1 hour. The oil dropping out may also be just the nitrile itself and you are letting it get to cold for the peroxide addition. Take scarecrows advice. You could thin it out a bit with methanol(not necessary and typically just a waste), itl just strip off while the amidation finishes.

You can isolate the nitrile but its really not worth while. Good job taking advantage of TLC, keep at it.

Report to moderator Logged

thewire

Dominant Wasp

Posts: 426

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #214 on:** February 18, 2017, 05:50:28 PM »

Quote from: magoo on June 23, 2016, 08:08:27 AM

Okay this procedure has been performed as described in *"An efficient copper (II)-catalyzed direct access to primary amides from aldehydes under neat conditions" Tetrahedron letters 53 (2012) 1413-1416* sans the Ethyl Acetate extraction and at 50x scale.

procedure:
0.5mol aldehyde**(1)**
0.5mol $NH_2OH.HCl$**(2)**
0.55mol Na_2CO_3**(3)**
0.025mol $CuSO_4$**(4)**

-In a 500ml beaker **(1)** was added to an intimate mixture of **(2)**,**(3)**,**(4)** resulting in mild exothermia and effervescence, which almost caused the reaction mixture to overflow.
-It was placed in an oil bath, heated to 110^oC with manual stirring, and kept there for 2hrs.
-The beaker was removed from the oil bath and allowed to cool. However at this point the reaction was abandoned for almost 24hrs.
-Upon return to the lab there was noted fine white 'hairs' that looked to be growing on the surface of a very dark green, hard waxy solid in the beaker that looked like akin to mould growing on molten crayola.. 'forrest green' to be exact.
-The beaker was returned to the oil bath to melt the solid (and free the glass stir rod)
-Whilst warm this was dissolved in ~700ml of acetone and then left to settle.
-The organic layer was poured into 1000ml cold dH_2O, resulting in the precipitation of a voluminous mass of fine fluffy crystals. This was then left so as to allow it to cool and let some acetone evaporate off.
-This was then filtered and washed with dH_2O, and dried under vacuum, leaving sparkly, off-white almost pastel mint product. Final weight will be posted when bone dry.

Notes:
-This was not monitored by TLC (due to inability to do so)
-The reaction starts out quite viscous and gets even moreso. The use of overhead stirring is suggested.
-The effervescence might be caused by the fact that the heldehyde had not been distilled prior to use, or perhaps because neither the $CuSO_4$ or Na_2CO_3 was anhydrous.
-The final yield will be lower than it should have been, as i used a small ~1g sample and tried, in vain, to use the typical workup for the nickel acetate beckmann rearrangement i.e. dumping into water when done.

Is there a simple method to separate oxime from amide?

When this procedure was tried twice but nothing else had been gotten than a sticky green goo. Which was worked up but no useful precursor was obtained. If one really wants to experiment and has got a lot of aldehyde to waste one might be able to make it eventually .

IMO aldehyde+ na-carbonate or naoh + hydroxylamine.hcl -> is the best way to get the oxime . If the aldehyde is fresh or distilled the chemist more likely

to get solid oxime. Otherwise getting liquid oxime is more common.

oxime+ni-acetate+xylene route recommended to obtain the amide.

Purification of thus formed amide can be done by disolving it in boiling h2o . Nitrile and unreacted oxime float on top of water often collects at the bottom of the beaker. Fast filtration on preheated funnel prevents the chrystallisation of the amide. Kitchen towel as filter paper is perfect for this operation . It allowes fast filtration but collects the unwanted substances. Amide usually precipitate in small snow white plates, with sharp melting point according to literature.

Report to moderator Logged

Scarecrow

Dominant Wasp

Posts: 430

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #215 on:** February 18, 2017, 06:51:50 PM »

100g
Helional (100g ~92ml)
Hydroxylamine HCl (36.93g)
DMSO (500ml)
NaOH (21g)
H2O2 30% soln (ph 7.5-7.😎 (600ml)

Helional mass: 192.21g/mol
Hydroxylamine.HCl mass: 69.49g/mol

Aldehyde (.52mol, 100g) was added to a solution of Hydroxylamine HCl (.53mol, 36.93g) in DMSO (500ml). This solution was then heated for 90 minutes at 85-90* over hot/boiling water with vigorous stirring [make sure RBF is open top]. Upon removal of heat, the solution was allowed to stand on a stirrer until the temp reached ~80*, and aqueous NaOH added** until a pH of 10 was reached (addition of NaOH solution causes smoke, and darkening of solution. Sharp change in pH noted). [optional: 6g of bicarb soda was added to aid as a pH buffer]. Then at 70*+, 500-600ml of neutralized 30% H2O2 was added dropwise through an addition funnel, maintaining the temperature under 95*, and monitoring the pH to keep it between 9-10 (add 10% NaOH solution if required) . Upon completion of the addition, the reaction was allowed to stir until gas evolution and exothermia had ceased. The resulting light yellow solution is poured into a pyrex dish at around 50*, and put in a 0* fridge and allowed to sit overnight. The resulting crystals vacuum filtered and washed with water. Yield quantitative. (Should have sparkling white amide crystals maybe with hints of yellow which should come off in a water wash).

Reasons for low yields can be overheating your Hydroxylamine/DMSO (anything over 100* will begin to cause yellow impure amide/lower yields), and not adding enough H2O2 in the correct pH range.

**Aqueous NaOH suggested: stoich NaOH in 200ml water. I.e 20.8g of NaOH in 200ml water.(11% solution), I usually make a bit extra in case the pH falls out of range.

Notes
- I recommend pre-dissolving hydroxylamine in a beaker in about 400ml DMSO then adding to RBF, adding aldehyde then rinsing with remaining 100ml of DMSO
- I run the reaction in a 3 neck RBF which during the H2O2 addition I allow to stand on a stirrer, maintaining temp on its own exothermia, keeping the temp

under 95* but optimally around 70-85. You may want to keep an ice bath separately to cool it. There will be moderate exothermia and your pH will decrease slowly if you do not basify your H2O2 before addition, so I highly recommend basifying your H2O2 before addition. If you don't basify your H2O2 before addition, you will find that as you add H2O2 the reaction, the pH will decrease out of reaction range and your reaction will die. You can continually add NaOH to bring your reaction back into pH range if you add non basified H2O2, but if you add too much NaOH you may cause rapid base catalyzed H2O2 decomposition and ruin your reaction (and your ceiling).
- Alternatively if you dont want to wait overnight to get pure amide thats recrystalized out of the DMSO, you can dunk your post reaction in cold water and vacuum filter immediately. Doesn't give as nice crystals though.

Stay safe!

Report to moderator Logged

It's a war on personal freedom, that's what it is.

magoo

Perpetual Bumblefuck Larvae

Posts: 27

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #216 on:** February 18, 2017, 07:34:27 PM »

I'm really sorry for not updating on this sooner...But it works..The yields have been higher than he obtained with the oxime>beckmann

Yes , He had read to filter the beckmann product hot to remove the oxime, he said it works wonders.
Sodium Acetate is the preferred base in the ref. but none was at hand.
It is the preferred route due to it being cheaper, quite a bit faster and going aldehyde>amide with water being the only solvent

The procedure has been played around with it a bit more.. up to 4mol..and a few things were noticed...

-When everything is added (without heat) it will sit for about 5-10 min with no apparent change, then due to gas formation, will foam up and the volume will expand 500%..it will subside with vigorous stirring, only to foam up again slightly at about the 30 min mark.

-There is a LOT of exothermia..it will take the reaction up to 90-100'C. DO NOT HEAT UNTIL EXOTHERMIA HAS SLOWED!!
The temperature ran away once..from 110 to over 200'C in a short time, fumes pouring out of the vessel before it shattered

-If the sides of the vessel are insulated it will stay close to that temp for quite a while, only needing slight heating to keep it at 110'C where it is kept for two hours.

-It will be a viscous green goo at first, there are subtle colour changes but when the reaction is nearing completion it will become even more viscous..be careful with your glass stir rods.

-When complete, tip the waxy molten mixture into a large amount of rapidly boiling water in a suitable container(use one that you can throw out afterwards, the remnants are quite hard to clean out)

-The amide will slowly dissolve into the rapidly boiling water.

-Filter hot through paper towel or coffee filter to remove the oxime.

-It will only need 2 or 3 recrystallizations to obtain clean amide.

-Use denatured ethanol to wash up equipment

Its fantastic..no solvents, no dmso, no nickel, no peroxide
However, it still involves heating a fairly concentrated hydroxylammonium mixture and the work up is messy..

EDIT: thewire were you using $CuSO_4{:}5H_2O$ or the anhydrous salt? Lower yields were had when using the anhydrous salt

« *Last Edit: February 18, 2017, 08:17:01 PM by magoo* » Report to moderator Logged

bsmathers

Pupae

Posts: 56

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote

« **Reply #217 on:** March 17, 2017, 08:37:27 PM »

Do you by any chance have pictures of these subtle color changes?

Report to moderator Logged

thewire

Dominant Wasp

Posts: 426

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote

« **Reply #218 on:** July 24, 2017, 07:59:27 PM »

Quote from: magoo on February 18, 2017, 07:34:27 PM

I'm really sorry for not updating on this sooner...But it works..The yields have been higher than he obtained with the oxime>beckmann

Yes , He had read to filter the beckmann product hot to remove the oxime, he said it works wonders.
Sodium Acetate is the preferred base in the ref. but none was at hand.
It is the preferred route due to it being cheaper, quite a bit faster and going aldehyde>amide with water being the only solvent

The procedure has been played around with it a bit more.. up to 4mol..and a few things were noticed...

-When everything is added (without heat) it will sit for about 5-10 min with no apparent change, then due to gas formation, will foam up and the volume will expand 500%..it will subside with vigorous stirring, only to foam up again slightly at about the 30 min mark.

-There is a LOT of exothermia..it will take the reaction up to 90-100'C. DO NOT HEAT UNTIL EXOTHERMIA HAS SLOWED!!
The temperature ran away once..from 110 to over 200'C in a short time, fumes pouring out of the vessel before it shattered

-If the sides of the vessel are insulated it will stay close to that temp for quite a while, only needing slight heating to keep it at 110'C where it is kept for two hours.

-It will be a viscous green goo at first, there are subtle colour changes but when the reaction is nearing completion it will become even more viscous..be careful with your glass stir rods.

-When complete, tip the waxy molten mixture into a large amount of rapidly boiling water in a suitable container(use one that you can throw out afterwards, the remnants are quite hard to clean out)

-The amide will slowly dissolve into the rapidly boiling water.

-Filter hot through paper towel or coffee filter to remove the oxime.

-It will only need 2 or 3 recrystallizations to obtain clean amide.

-Use denatured ethanol to wash up equipment

Its fantastic..no solvents, no dmso, no nickel, no peroxide
However, it still involves heating a fairly concentrated hydroxylammonium mixture and the work up is messy..

EDIT: thewire were you using $CuSO_4$:$5H_2O$ or the anhydrous salt? Lower yields were had when using the anhydrous salt

---

Well done! I'm glad you made it work.

Hydrated CuSO4 was used.

In spite of the progress it's still unattractive to me due to thermal runaway.

Report to moderator Logged

Tsathoggua
Spaz Tech
Founding Wasp

Posts: 3,235

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #219 on:** July 25, 2017, 07:33:08 AM »

Just a point regarding ether...the combination of ethers (most of them at least) and peroxide does not sound like a good one.

Report to moderator Logged

Nomen mihi Legio est, quia multi sumus

I'm hyperbolic, hypergolic, viral, chiral. So motherfucking twisted my laevo is on the right side.

sparklebags
Dominant Wasp

Posts: 457

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #220 on:** July 17, 2018, 03:43:34 AM »

This is my first attempt at anything of this nature...I have received some help from a few of you guys and am just beyond excited and grateful - even if I failed, the process was so wonderfully enlightening and I look forward to the future. I attempted my first run with 25g in a 2L flask.

I THINK all is well, maintained temp between 85 and 90 for an hour, turned heat off on heating mantle allowed to cool to 70*, added NaOH until ph of 10 was achieved. Started adding H2O2 (basified to 7.5ph) dropwise, added NaOH to maintain ph between 10- 12 (occasionally slipped down to 9.5). Only had one foam up when I got zealous with the addition of base - otherwise mild exothermic reaction. I ended up adding 250ml of H2O2 instead of 150ml (I had made a dilute solution from some 50% stock I had), not sure if that screwed me. Currently the solution is stirring and cooling, has an orangish/reddish/yellowish color and ever so faint sassafras smell. Never went black, never got an ammonia from it. I am debating on putting it in the fridge Ala Scarecrow or just letting it stir overnight. Fingers crossed!

Report to moderator Logged

sparklebags
Dominant Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES

Quote

Posts: 457

INTO AMIDES results
« **Reply #221 on:** July 17, 2018, 01:25:38 PM
»

After stirring overnight, I was left with an oily orangish liquid with some dark red blobs that all stayed together. I put that whole lot in a pyrex in a 0* fridge. Off to start round 2!

Report to moderator Logged

sparklebags
Dominant Wasp
Posts: 457

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote
« **Reply #222 on:** July 22, 2018, 02:17:43 PM
»

I THINK this is the amide....

IMG_0806.jpg (394.44 kB, 3024x4032 - viewed 280 times.)

Report to moderator Logged

unlikely_username
Subordinate Wasp
Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote
« **Reply #223 on:** July 22, 2018, 11:10:30 PM
»

Quote from: sparklebags on July 22, 2018, 02:17:43 PM

> I THINK this is the amide....

Looks good to me.

Report to moderator Logged

carl
Global Moderator
Founding Wasp

Posts: 5,626

circular pastry filled with hazelnut crime

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote
« **Reply #224 on:** August 04, 2018, 10:15:18 AM »

Assumed one has tried the method using I2 in concentrated(used 25%) ammonia, followed by 30% H2O2 one hour later.
But the produced compound is an oil, does not react under hydrolysis in concentrated lye and refuses otherwise to solidify.
What have I produced there?
Can anyone give some insight?
It smells very much like amide though.

Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information

Quote

> Real bees just hear the buzzing and it doesn´t ever stop. Ever.

Tsathoggua

Spaz Tech
Founding Wasp

Posts: 3,235

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #225 on:** August 04, 2018, 06:32:19 PM »

I2 in conc NH3? Isn't that the classic school room demo prep for nitrogen triiodide? (not implying this to be the oily product, just a potential way for such a combination to go south, NI3 is extraordinarily shock sensitive, a dark solid, not quite so infernal when kept wet with ammonia, cold and without exposure to light, but if there is to bee a filtration step before treatment with peroxide then that might well be enough to set it off in light, its just about the last thing anyone wants to accidentally form.

Can't see it behaving itself if moved, even damp, its still a liability.

Reminds Tsath' of one rather unfortunate if apt nasty little kids tricks, namely (at least attempting to, wet) placing it, in solution, onto sugar, when there were wasps about. You can guess the rest, wasp sees sugar, lands, no more wasp.

Report to moderator Logged

Nomen mihi Legio est, quia multi sumus

I'm hyperbolic, hypergolic, viral, chiral. So motherfucking twisted my laevo is on the right side.

carl

Global Moderator
Founding Wasp

Posts: 5,626

circular pastry filled with hazelnut crime

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #226 on:** August 04, 2018, 07:02:09 PM »

Quote

> not quite so infernal when kept wet with ammonia

It was repeated ad nauseam here, it is not the least bit dangerous in aqueous media...

Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information

Quote

> Real bees just hear the buzzing and it doesn´t ever stop. Ever.

Tsathoggua
Spaz Tech
Founding Wasp

Posts: 3,235

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #227 on:** August 04, 2018, 09:28:09 PM »

Wasn't sure whether the reaction mixture was filtered or otherwise isolated before reaction with peroxide.

Report to moderator Logged

Nomen mihi Legio est, quia multi sumus

I'm hyperbolic, hypergolic, viral, chiral. So motherfucking twisted my laevo is on the right side.

carl
Global Moderator
Founding Wasp

Posts: 5,626

circular pastry filled with hazelnut crime

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #228 on:** August 04, 2018, 09:59:58 PM »

Actually the NI3 gets used up in this synthesis before the peroxide is added, that is visible with the colour change.
Also, dioxane was used as co-solvent in my approach.

Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information

Quote

> Real bees just hear the buzzing and it doesn´t ever stop. Ever.

Tsathoggua
Spaz Tech
Founding Wasp

Posts: 3,235

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #229 on:** August 05, 2018, 12:00:32 AM »

With the peroxide?

Report to moderator Logged

Nomen mihi Legio est, quia multi sumus

I'm hyperbolic, hypergolic, viral, chiral. So motherfucking twisted my laevo is on the right side.

unlikely_username
Subordinate Wasp

Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #230 on:** August 05, 2018, 12:26:55 AM »

Quote from: carl on August 04, 2018, 10:15:18 AM

> Assumed one has tried the method using I2 in concentrated(used 25%) ammonia, followed by 30% H2O2 one hour later.
> But the produced compound is an oil, does not react under hydrolysis in concentrated lye and refuses otherwise to solidify.
> What have I produced there?
> Can anyone give some insight?
> It smells very much like amide though.

Details with the H2O2 oxidation? If that didn't go to completion I could see you ending up with a bunch of nitrile.

Report to moderator Logged

carl
Global Moderator
Founding Wasp

Posts: 5,626

circular pastry filled with hazelnut crime

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #231 on:** August 05, 2018, 12:41:59 AM »

Used 14ml of 30%, on a scale of 20mmol aldehyde, added it one hour after the iodine addition, and then left it to react two hours further at RT.
No vigorous reaction by the way, even though it was added all at once.
Is there any solubility data for the nitrile?

Can react it again anytime with peroxide, of course.

An interesting properties of it was, that it was fully soluble in EtOH, but when water was added to this, it caused a turbid solution and a day later it has collected again as oil on the bottom of the flask.

Report to moderator Logged

> **Quote from: Moriarty on September 08, 2015, 05:10:02 AM**
>
> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information
>
> **Quote**
>
> Real bees just hear the buzzing and it doesn´t ever stop. Ever.

unlikely_username
Subordinate Wasp

Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #232 on:** August 05, 2018, 04:35:46 AM »

The nitrile will be insoluble in water at RT. It should be soluble in ethanol. As you saw when you diluted the ethanolic solution with water.
I would give a shot at oxidizing your oil with using the H2O2 in aqueous basic DMSO route that we use for the nitrile produced via hydroxylamine. If that doesn't work either start troubleshooting the I2/NH3 reaction.

Report to moderator Logged

carl
Global Moderator

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

Founding Wasp

Posts: 5,626

circular pastry filled with hazelnut crime

« **Reply #233 on:** August 05, 2018, 09:10:02 PM »

Yeah, ok, thanks for the help, it worked now

We can now accept the fact, that the given amount of peroxide in the referred paper is way too small(3ml 35% on 5mmol aldehyde) to produce the amide...

I need to figure out the correct sufficient amount now.

But other than that, this route works really well, the yield is very high too, so for anyone who has no ready access to hydroxylamine HCl, but to cheap iodine, and wants to produce helionamide, this route is a viable alternative. No danger of explosion too, of course, since it is conducted in aqueous media.

Exploring alternative routes is fun

Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information

Quote

> Real bees just hear the buzzing and it doesn´t ever stop. Ever.

Tsathoggua

Spaz Tech
Founding Wasp

Posts: 3,235

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #234 on:** August 05, 2018, 09:37:01 PM »

Still have to wonder if the nitrogen trihalides, NF3 excluded, if they are THAT safe, even in solution, it is afterall THE most sensitive of contact primaries known to mankind, AFAIK with perhaps NCl3 the ONLY explosive that can be detonated by a stray alpha particle, which more or less, given our bombardment with cosmic rays, equates to 'for the hell of it, there are more than a mere handful of liquid-phase HEs and PEs, just gives Tsath' the willies, so to speak, given quite how notoriously sensitive the nitrogen trihalides are, even alkyl perchlorates aren't THAT ill-tempered, and all the lower ones take is addition of a drop of H2O to set them off. the NI3 adducts, derivatives and what have you, they don't NEED a reason to go off, if ever there was one barely isolable bastard of a primary contact explosive, with a penchant for spontaneous detonation, NI3 and co are it.

Report to moderator Logged

Nomen mihi Legio est, quia multi sumus

I'm hyperbolic, hypergolic, viral, chiral. So motherfucking twisted my laevo is on the right side.

fastbre4k

Subordinate Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #235 on:** August 05, 2018, 09:45:45 PM »

somebody try TCCA 0.75eq. in 15M NH3 60°C 1-5H to get the nitrile

Posts: 170

Report to moderator Logged

carl

Global Moderator
Founding Wasp

Posts: 5,626

circular pastry filled with hazelnut crime

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

« **Reply #236 on:** August 05, 2018, 10:28:25 PM »

Quote

Quote from: Tsathoggua on August 05, 2018, 09:37:01 PM

> Still have to wonder if the nitrogen trihalides, NF3 excluded, if they are THAT safe, even in solution...

NCl3 is not, NI3 is
Trust me, if you have problems trying this synthesis out, I'll pay your glass, ok?
NI3 needs a reason to go off, it is to be properly dried.

Quote from: fastbre4k on August 05, 2018, 09:45:45 PM

> somebody try TCCA 0.75eq. in 15M NH3 60°C 1-5H to get the nitrile

No do not!
That is a horribly unsafe method, because of the NCl3, which happens fit on what tsath said.

Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information

Quote

> Real bees just hear the buzzing and it doesn´t ever stop. Ever.

fastbre4k

Subordinate Wasp

Posts: 170

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

« **Reply #237 on:** August 05, 2018, 11:05:55 PM »

Quote

jeah but in water it decomposed to NH3 and HClO just go very slowly with the TCCA and grind it to a fine powder.

this shit is so fucking exothermic - i thought wtf is happening as i threw the first bits of TCCA in xD

wiki says it's even stable to 18% solution

done it with 100ml NH3 25%, 10g Benzylalcohol, 16.12g TCCA - but

nevermind the workup is shitty..

« *Last Edit: August 05, 2018, 11:26:44 PM by fastbre4k* » Report to moderator Logged

Tsathoggua

Spaz Tech
Founding Wasp

Posts: 3,235

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #238 on:** August 05, 2018, 11:32:20 PM »

It loses NH3, initially forming an adduct, of higher NH3 content then spontaneously loses NH3 to form lower, more unstable and closer to stoichiometric adducts, definitely not something one ever wants as a solid, but surely, will defer to your experience on this one. Tsath' CAN'T be caught with anything bearing the word 'peroxide', the way things have been going, if he was an acne patient and was prescribed benzoyl peroxide topical gel, that'd be enough to get his front door blown off by an assault team.

3-9% H2O2 already HAS, so he will have to take your word for it, it just isn't a reagent Tsath' can keep around. Binary VX? probably, if he wanted to and used less obvious IUPAC nomenclature for the QL, but if it's got the word 'peroxide' can't have it in the same building, not even 1%. the word alone is dangerous here these days.

Edit-does that count? Tsath' eagerly awaits a replacement for that damnable contraption in the back garden fuming Cl2 and worse...well...it is, strictly speaking, a problem. It can't be done, that has to count

« *Last Edit: August 05, 2018, 11:34:40 PM by Tsathoggua* » Report to moderator Logged

Nomen mihi Legio est, quia multi sumus

I'm hyperbolic, hypergolic, viral, chiral. So motherfucking twisted my laevo is on the right side.

fastbre4k

Subordinate Wasp

Posts: 170

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #239 on:** August 06, 2018, 10:53:32 AM »

but YOOO, that's like 7 grams of Iodine for 1 gram of benzylalcohol please correct me

Report to moderator Logged

carl

Global Moderator
Founding Wasp

Posts: 5,626

circular pastry filled with

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #240 on:** August 06, 2018, 11:08:06 AM »

It is only ~6g for ~10g helional though.

Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I

hazelnut crime

promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information

Quote

Real bees just hear the buzzing and it doesn´t ever stop. Ever.

unlikely_username

Subordinate Wasp

Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #241 on:** August 06, 2018, 02:47:14 PM »

You should be able to recover the iodide for regeneration into iodine right?

Report to moderator Logged

carl

Global Moderator
Founding Wasp

Posts: 5,626

circular pastry filled with hazelnut crime

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #242 on:** August 06, 2018, 03:36:41 PM »

Quote from: unlikely_username on August 06, 2018, 02:47:14 PM

You should be able to recover the iodide for regeneration into iodine right?

Since it is with my knowledge so far likely, that it will react to ammonium iodide after the peroxide addition, I would guess that must be very easy possible.
Of course the whole lot of ammonia has to be neutralised at first.
I haven't attempted it, because it was only a mere of 2,77g.

You very likely know already how this works.

But for others, after it was acidified, a simple oxidation with with peroxide leads to the iodine precipitating, bleach does probably work too, but I wouldn't want to use it here.
Despite it being at this point only ammonium salts, the synthesis of chloramine and hydrazine using ammonia and bleach comes to mind

Edit: While the original paper states 3ml 35% H_2O_2 per 5mmol substrate, in reality(or especially for our substrate) twice as much peroxide is much closer to reality.
I haven't kept close attention to the actual amount, this would require a little calculation, due to some mechanical and other losses of the nitrile, but twice as much comes very close.
And it would also correspond to what we need on peroxide on nitrile produced with the other widely used synthesis via hydroxylamine/DMSO.

Quote from: Tsathoggua on August 05, 2018, 11:32:20 PM

...
3-9% H_2O_2 already HAS
...

I hope that is also sufficient, have myself searched much to find a strong peroxide solution instead, as I haven't trusted a lower strength to already suffice.
It would be, I assume, a surely very valuable fact for many other people who lack access to the nowadays very hard to get strong peroxide solutions, if you can verify this as working!

« *Last Edit: August 06, 2018, 03:43:28 PM by carl* » Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information

Quote

> Real bees just hear the buzzing and it doesn´t ever stop. Ever.

atara
Founding Wasp
Posts: 2,257

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #243 on:** August 06, 2018, 06:16:08 PM »

Quote

> You should be able to recover the iodide for regeneration into iodine right?

Bromide can be precipitated efficiently as the hexamminecobalt (iii) tribromide, which is very poorly soluble in water, and which contains 3 moles of bromine for one mole of cobalt. I don't know if iodide can be extracted the same way. Silver iodide precipitates quantitatively, but that requires silver. I don't know many other insoluble iod**ide**s, although calcium iod**ate** is highly insoluble and iodide may be converted to iodate by oxidation in alkali.

Report to moderator Logged

unlikely_username
Subordinate Wasp
Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #244 on:** August 06, 2018, 08:52:17 PM »

Quote from: atara on August 06, 2018, 06:16:08 PM

> **Quote**
>
> > You should be able to recover the iodide for regeneration into iodine right?
>
> Bromide can be precipitated efficiently as the hexamminecobalt (iii) tribromide, which is very poorly soluble in water, and which contains 3 moles of bromine for one mole of cobalt. I don't know if iodide can be extracted the same way. Silver iodide precipitates quantitatively, but that requires silver. I don't know many other insoluble iod**ide**s, although calcium iod**ate** is highly insoluble and iodide may be converted to iodate by oxidation in alkali.

I was thinking more along the lines of evaporation of the ammonia solution to yield ammonium iodide. If the solution has any brown/purple color to it you'd probably first want to add something like sodium bisulfite to reduce residual iodine to iodide to eliminate any risk of precipitating NI3.

« *Last Edit: August 06, 2018, 09:00:13 PM by unlikely_username* » Report to moderator Logged

carl
Global Moderator
Founding Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

Posts: 5,626

circular pastry filled with hazelnut crime

« **Reply #245 on:** August 06, 2018, 10:13:26 PM »

Ammonia evaporation, ok?
Have made the post-reaction solution very cautiously acidic(with 30% HCl) to have it easier using DCM for the extraction, acidified while it was stirred in an ice bath of course.
So this is very possible and probably the safest and cheapest method to make the solution ready for iodine recovery.
Although the volume will increase a lot of course
Since I2 is insoluble in aq. media, why not use this way?

By the way, now that you've mentioned it I am a bit annoyed with myself that I haven't thought about iodine recovery and missed the chance to oxidise the acidic solution after the nitrile was extracted... really a wasted opportunity.

Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information

Quote

> Real bees just hear the buzzing and it doesn´t ever stop. Ever.

unlikely_username

Subordinate Wasp

Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote

« **Reply #246 on:** August 07, 2018, 04:53:32 AM »

Quote from: carl on August 06, 2018, 10:13:26 PM

> Ammonia evaporation, ok?
> Have made the post-reaction solution very cautiously acidic(with 30% HCl) to have it easier using DCM for the extraction, acidified while it was stirred in an ice bath of course.
> So this is very possible and probably the safest and cheapest method to make the solution ready for iodine recovery.
> Although the volume will increase a lot of course
> Since I2 is insoluble in aq. media, why not use this way?
>
> By the way, now that you've mentioned it I am a bit annoyed with myself that I haven't thought about iodine recovery and missed the chance to oxidise the acidic solution after the nitrile was extracted... really a wasted opportunity.

That would actually work quite nicely. Acidify the reaction mixture and extract it. Then oxidise the acidic rxn mixture with H2O2 and filter out your iodine.

Report to moderator Logged

atara

Founding Wasp

Posts: 2,257

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote

« **Reply #247 on:** August 07, 2018, 07:45:11 AM »

The issue with oxidizing iodine to recover it is the formation of I3-, ICl2-, and

other complex ions that effectively increase the solubility of I2 in solution. You need to completely oxidize I- to I2 without oxidizing it to IO3-.

I like the ammonia evaporation way...

Report to moderator Logged

unlikely_username
Subordinate Wasp
Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #248 on:** August 07, 2018, 11:42:06 PM »

Quote from: atara on August 07, 2018, 07:45:11 AM

> The issue with oxidizing iodine to recover it is the formation of I3-, ICl2-, and other complex ions that effectively increase the solubility of I2 in solution. You need to completely oxidize I- to I2 without oxidizing it to IO3-.
>
> I like the ammonia evaporation way...

I'm a bit of a fan, because you could distill the ammonia and recover the majority of it for the next run. That would make the nitrile formation almost 0 waste.

Report to moderator Logged

carl
Global Moderator
Founding Wasp

Posts: 5,626
circular pastry filled with hazelnut crime

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #249 on:** August 08, 2018, 12:38:46 AM »

Ok regarding distillation instead of evaporation(that sounds like a heated solution in the open with ammonia stink everywhere to me?), I'm in for this too, that is a much better idea of course, another one that didn't get to me in that experiment

It fits to the thread that an Ac2O/DMSO oxidation of the bisulfite adduct is at the moment running, so either new results(or new problems) will come soon

Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information

Quote

> Real bees just hear the buzzing and it doesn´t ever stop. Ever.

Tsathoggua
Spaz Tech
Founding Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #250 on:** August 08, 2018, 05:37:46 PM »

Posts: 3,235

Carl, you misunderstand Tsath's predicament. The OTC peroxide is full of garbage, phenacetin, phosphoric acid, and its weak as shit. And even THAT, just having the word 'peroxide' readable, is enough here to put Tsath' in danger.

Report to moderator Logged

Nomen mihi Legio est, quia multi sumus

I'm hyperbolic, hypergolic, viral, chiral. So motherfucking twisted my laevo is on the right side.

sparklebags

Dominant Wasp

Posts: 457

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #251 on:** August 25, 2018, 06:44:56 PM »

Somewhat of a regression in the conversation but perhaps useful to other newbies, we have had great success with scaling this up to 500g of aldehyde. We have found that setting a stirring mantle to 55* seems to be the sweet spot, there is a brief spike where we have to take it off (sometimes cooling it on the bench, every once in a while it requires a quick dunk in an ice bath). Once that initial jump stabilizes (which is typically after 15-20 min) we are able to let it run for another hour or so between 82 and 85*. The oxidation is similar, in our experience, in that there is an initial jump in exothermic activity and then it stabilizes. We have found that basifiyng our H2O2 to anything above ph7.2 causes problems as we are adding so much per synthesis it seems to become overly concentrated sitting on top of a hot flask in an addition funnel. We don't start the addition until we get a ph10 from addition of NaOH 10% and the temp is typically around 70*. After an initial push, the temp. jumps up to 90*, we then set it at a drip rate of about 2 drops per second and can essentially walk away with the exception of adding base to keep the ph around 10. Though we have noticed that when we keep it at ph9.3 the reaction is the most vigorous. Once we over did the base and ended up with very nice pure white crystals but and abysmal yield. Most runs we are getting around 70%, but there have only been a few so I wouldn't call that a given yet. In other news, attempted the Hoffman using dioxane as a co-solvent and about gassed myself out! Dissolved the 500g of amide in about 500ml of dioxane, added it to a stirring flask, added TCCA and BOOM! instant boiling and off gassing. Once we got the ice bath addressed and added 4L of NaOH, it calmed down but not before cooking the crap out of the amide.

Report to moderator Logged

sparklebags

Dominant Wasp

Posts: 457

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #252 on:** August 25, 2018, 11:04:26 PM »

I should have added - the resolution to the dioxane was to simply mix it with the amide and then add it to the already chilled TCCA and NaOH solution. Will report back on yields.

Report to moderator Logged

Tsathoggua

Spaz Tech
Founding Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #253 on:** August 26, 2018, 01:24:49 AM »

Posts: 3,235

Here's a thought, nitriles are easily reduced to amines, what about formation of the amide, dehydration with (preferably) SOCl2 or alternatively phosphorus oxychloride to transform amide>nitrile tjhen reduction with lithium borohydride (produced via ball-milling of NaBH4 and LiBr.)

Report to moderator Logged

Nomen mihi Legio est, quia multi sumus

I'm hyperbolic, hypergolic, viral, chiral. So motherfucking twisted my laevo is on the right side.

unlikely_username

Subordinate Wasp

Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #254 on:** August 26, 2018, 09:18:58 PM »

Quote from: Tsathoggua on August 26, 2018, 01:24:49 AM

> Here's a thought, nitriles are easily reduced to amines, what about formation of the amide, dehydration with (preferably) SOCl2 or alternatively phosphorus oxychloride to transform amide>nitrile tjhen reduction with lithium borohydride (produced via ball-milling of NaBH4 and LiBr.)

Why on earth would you form the nitrile from the aldehyde, oxidize it to the amide, then dehydrate it back to the nitrile?

And what on earth would you want to do with the useless amine you formed from such a reduction? The hofmann degradation is used for a reason, it involves shortening of the carbon chain. This particular point has been covered ad nauseum for the aldehyde in question, quite probably in this very thread even.

Report to moderator Logged

Tsathoggua

Spaz Tech
Founding Wasp

Posts: 3,235

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #255 on:** August 26, 2018, 09:38:10 PM »

Noo...meant formation of the isopropionaminonitrile then take it to the nitrile and reduce. Although looking at the Hofmann...shit, Tsath' KNEW that, but was really damn drunk last night.

Report to moderator Logged

Nomen mihi Legio est, quia multi sumus

I'm hyperbolic, hypergolic, viral, chiral. So motherfucking twisted my laevo is on the right side.

Loki
Dominant Wasp
Posts: 407

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #256 on:** August 30, 2018, 10:53:36 PM »

Has anyone considered oxidative decarboxylation of a carboxylic acid to an alkene using something like lead tetraacetate? This could give you access to the 1-propenylbenzene from the aldehyde.

https://www.sciencedirect.com/science/article/pii/0040402068881244

Report to moderator Logged

atara
Founding Wasp
Posts: 2,257

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #257 on:** September 04, 2018, 12:41:08 AM »

Haven't heard of that but it looks good. Issue is the resulting route becomes long (aldehyde -> acid -> alkene -> epoxide -> ketone -> amine) but doable.

Report to moderator Logged

Zippy
Founding Wasp
Posts: 542

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #258 on:** September 04, 2018, 12:48:23 AM »

I thought that getting to the ketone was desirable so people could make the N-methyl instead of the usual routes that lead to MDA.

Report to moderator Logged

Tsathoggua
Spaz Tech
Founding Wasp

Posts: 3,235

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #259 on:** September 04, 2018, 08:27:12 PM »

IIRC lead tetraacetate has also been used for for Hoffmann degradation.

Report to moderator Logged

Nomen mihi Legio est, quia multi sumus

I'm hyperbolic, hypergolic, viral, chiral. So motherfucking twisted my laevo is on the right side.

carl
Global Moderator
Founding Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #260 on:** September 04, 2018, 08:33:52 PM »

> **Quote from: Tsathoggua on September 04, 2018, 08:27:12 PM**
>
> IIRC lead tetraacetate has also been used for for Hoffmann degradation.

And what has that to do with the topic?

Posts: 5,626

circular pastry filled with hazelnut crime

The topic here is amidation, please post in the corresponding Hofmann topic if you have a valuable thing to add...

Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information

Quote

> Real bees just hear the buzzing and it doesn´t ever stop. Ever.

Tsathoggua

Spaz Tech
Founding Wasp

Posts: 3,235

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #261 on:** September 04, 2018, 09:20:11 PM »

Mentioned it beecause Tsath' has a fairly good idea what aldehyde is beeing intended to go to what amide. And that the amide in question is often subjected to the Hoffmann, in the course of MDA synthesis.

Report to moderator Logged

Nomen mihi Legio est, quia multi sumus

I'm hyperbolic, hypergolic, viral, chiral. So motherfucking twisted my laevo is on the right side.

carl

Global Moderator
Founding Wasp

Posts: 5,626

circular pastry filled with hazelnut crime

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #262 on:** September 04, 2018, 10:20:00 PM »

Then put it into any of the Hofmann related topics, simple as that!

Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information

Quote

> Real bees just hear the buzzing and it doesn´t ever stop. Ever.

Tsathoggua

Spaz Tech
Founding Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #263 on:** September 05, 2018, 01:26:54 AM »

You are missing the point, Carl. If its possible to use it to convert the aldehyde to the amide, then if the reagent in question also effects a hoffmann degradation then they are going to be left wondering when they aren't left

Posts: 3,235

with amide, and if they treat the amine as if it were amide, potentially screw things up. So its quite relevant. So leaving out the information that it can also perform Hoffmann degradations in this particular thread, given the particular amide or similar ones that they are probably going to be using it for, could well leave them for example, throwing out an aqueous wash, which could potentially contain some or all of their sought amine. Throwing the baby out with the bathwater sucks. So don't have a go at Tsath' for including it. Pb(OAc)4 was mentioned, in the context of this thread, and if it could lead to someone tossing out what they thought were water soluble impurities, but is in fact, sought amine, Tsath' would be doing far worse if he just left it unmentioned for someone to find out the hard way, no?

Report to moderator Logged

Nomen mihi Legio est, quia multi sumus

I'm hyperbolic, hypergolic, viral, chiral. So motherfucking twisted my laevo is on the right side.

Loki

Dominant Wasp

Posts: 407

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #264 on:** September 07, 2018, 12:19:07 AM »

Quote from: Tsathoggua on September 05, 2018, 01:26:54 AM

> You are missing the point, Carl. If its possible to use it to convert the aldehyde to the amide, then if the reagent in question also effects a hoffmann degradation then they are going to be left wondering when they aren't left with amide, and if they treat the amine as if it were amide, potentially screw things up. So its quite relevant. So leaving out the information that it can also perform Hoffmann degradations in this particular thread, given the particular amide or similar ones that they are probably going to be using it for, could well leave them for example, throwing out an aqueous wash, which could potentially contain some or all of their sought amine. Throwing the baby out with the bathwater sucks. So don't have a go at Tsath' for including it. Pb(OAc)4 was mentioned, in the context of this thread, and if it could lead to someone tossing out what they thought were water soluble impurities, but is in fact, sought amine, Tsath' would be doing far worse if he just left it unmentioned for someone to find out the hard way, no?

Who said it was used to make the amide? You mention the Hoffmann degradation, which is different from the rearrangement. Pb(OAc)4 was to be used to produce the alkene.

Loki

Report to moderator Logged

atara

Founding Wasp

Posts: 2,257

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #265 on:** September 07, 2018, 07:02:29 AM »

Truth be told, most of the discussion on amide formation is over. It's obviously the easier step in the Beckmann-Hofmann route. A lot of the posts in this thread have been other ideas about helional.

Maybe we should make more general threads, like on Hyperlab.

Report to moderator Logged

El_Kabong

Subordinate Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES

Quote

Posts: 126

INTO AMIDES results
« **Reply #266 on:** September 07, 2018, 02:16:26 PM »

There would be amide formation by a different approach.
Whether it forms in the desired place or not?99% sure the desired amide/ ammonium salt is produced.

PhCH2CHCH3--(NH4)2Sx--> PhCH2CHCH3
CHO CONH2

Willgerodt rxn does work for Phalkylaldehydes to amides/ammonium salts too.
If that is worth looking into?
JOC 12,p.76 (1947)
Monatsh.Chem 98 p.825 (1967)

« *Last Edit: September 08, 2018, 02:07:59 AM by El_Kabong* »

Report to moderator
Logged

unlikely_username
Subordinate Wasp

Posts: 241

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #267 on:** September 08, 2018, 07:36:46 AM »

Quote

When 99.3g helional was subjected to the nitrile formation step utilizing 1.08 equiv Hydroxylamine HCl in only 200mL of DMSO the reaction ran to completion in under the standard conditions (~80*C for 60 minutes). Completion was judged by the disappearance of the helional spot by TLC (EtOAc:Hexanes ~1:4). TLC was performed by taking an aliquat of the reaction solution, flushing it with several times it's volume in water, and extracting that with a small quantity of EtOAc, which was used for spotting the plate. TLC results were validated by doping a portion of said aliquat with helional, and verifying a spot appeared where expected, where before there had been none.
UV visualization appeared to work, but visualization with I2 was found to be preferable.

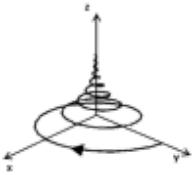
tl;dr - the nitrile formation works with about a 50% reduction in DMSO from what I've previously used.

This doesn't mean I recommend running the reaction this way if you intend to use the established H2O2 oxidation, as reducing DMSO content in the nitrile formation step has led to solubility issues in the oxidation step in the past. I decided to try this because I want to isolate the nitrile and play around with it.

Edit: I should note that the exothermia noted previously in this thread is extremely pronounced when solvent volume is reduced to this point. It became quite noticeable ~55*C, and proceeded to heat the flask (which was removed from heat around this point, but allowed to continue stirring) all the way up to 75*C within a couple minutes. Upon removal from stirring and submersion in a cool water bath the temperature continued to climb all the way to 95*C, despite ice being added to the bath.
It is recommended that the hydroxylamine be added in portions to prevent this.

« *Last Edit: September 08, 2018, 07:42:44 AM by unlikely_username* » Report to moderator
Logged

phantograx
Subordinate Wasp



Posts: 107

Posts: 782,171

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #268 on:** October 11, 2018, 01:24:51 PM »

A fairly new paper describing aldehyde to amide with mostly OTC conditions is linked. Very worthwhile of investigation in my opinion.

Convenient metal-free direct oxidative amidation of aldehyde using dibromoisocyanuric acid under mild conditions
Using dibromoisocyanuric acid in DCM, the acyl halide is formed and then amine and base is used to produce the amide all at room temperature.

TCCA which is usually much more available and OTC should be a suitable substitute for DBI and preform the identical function, as shown in the 2nd paper linked the acyl chloride can be formed.
Metal-Free Direct Oxidation of Aldehydes to Esters Using TCCA

The paper uses triethylamine as a base but mentions it only had a 1% higher yield than sodium bicarbonate which is interchangeable, and also mentions using no base at all still provided yields "more than 80%" vs 94% with Et3N

Acyl chloride with ammonia should be simple reaction to form the amide however only substituted amines are shown as examples.

The only part that seems potentially non OTC is the DCM which seems fairly essential, i'm not sure on availability in every country but i find it OTC here but i feel might be more difficult to acquire elsewhere.

« *Last Edit: October 11, 2018, 01:43:59 PM by phantograx* » Report to moderator Logged

Tsathoggua
Spaz Tech
Founding Wasp

Posts: 3,235

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #269 on:** October 12, 2018, 08:04:56 PM »

DCM might be substituted with chloroform given the similarity of the two. No guarantees of course, given Tsath' hasn't personally tried to do so, but for those who can't find dichlor in things like paint stripper anymore (like us brit bees, now paint stripper is all NMP, benzyl alcohol, occasionally triethylamine or nitrilotriacetic acid, sometimes utter shite like surfectants that you'd not even want near your glassware. Used to be DCM in most of them, now its banned, probably due to some shitspeak directive of those EU jizz-gargling whorespawn.

Chloroform if anyone can't buy it directly, can be prepared by using the haloform reaction on acetone using hypochlorite. Large volumes of bleach if using household stuff are required, compared to acetone, ideally making fresh solution to minimize the volume of crap to deal with after would be useful IMO. Be aware, it's pretty exothermic.

Although, DCM isn't scarce, even here where it's banned in OTC stuff (although IIRC it is still allowed in very small quantities such as the solvent in spray glues that have to dry rapidly, although that is hardly a viable source). Not expensive or hard to find either via a certain auction site, or from chemical suppliers. DCM is hardly an uncommon chemical in labs worldwide, very common solvent in fact. While some shitholes like the US might potentially monitor it just because they can and because their heads are jammed firmly up the eye of their dicks (along the lines of making the likes of diethyl ether

and KMnO4 a high priority list-1 chemical, because pot perm is used in cleaning up coke during the extraction process from the coca itself...it isn't like that even HAPPENS in the US, that all gets done before the cocaine powder is even exported from the country of origin)

So, not the kind of thing chemical companies are liable to keep a close eye on, And there is always auctions...

Or, as mentioned, haloform on acetone.

Report to moderator Logged

Nomen mihi Legio est, quia multi sumus

I'm hyperbolic, hypergolic, viral, chiral. So motherfucking twisted my laevo is on the right side.

superlative
Subordinate Wasp

Posts: 140

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

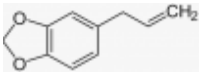
Quote

« **Reply #270 on:** May 26, 2020, 09:19:38 PM
»

Does anyone have a drawing of the mechanisms in the DMSO reaction(s). aldehyde->nitrile->amide?

Report to moderator Logged

dead_rat_organs
Larvae



Posts: 34

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #271 on:** June 15, 2020, 07:24:13 PM
»

Look up oxime formation, you'll see the mechanism that depicts the aldehyde being converted into an oxime. from there, once again you will need to UTSE, look up the beckmann rearrangement, and with some looking you can find the mechanisms that show the oxime being turned into an amide. Now apply these mechanisms to the aldehyde you are using and you have the full scheme for aldehyde->amide.

Report to moderator Logged

carl
Global Moderator
Founding Wasp

Posts: 5,626

circular pastry filled with hazelnut crime

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #272 on:** June 15, 2020, 07:29:51 PM
»

Quote from: dead_rat_organs on June 15, 2020, 07:24:13 PM

> Look up oxime formation, you'll see the mechanism that depicts the aldehyde being converted into an oxime. from there, once again you will need to UTSE, look up the beckmann rearrangement, and with some looking you can find the mechanisms that show the oxime being turned into an amide. Now apply these mechanisms to the aldehyde you are using and you have the full scheme for aldehyde->amide.

No, because it is a different process here in the one-pot reaction.
No oxime is ever being formed here

Report to moderator Logged

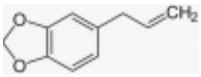
Quote from: Moriarty on September 08, 2015, 05:10:02 AM

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information

Quote

> Real bees just hear the buzzing and it doesn´t ever stop. Ever.

dead_rat_organs
Larvae



Posts: 34

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

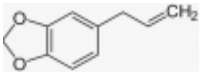
« **Reply #273 on:** June 15, 2020, 07:32:10 PM »

Quote

Oh, really? Well in that case I really would have no idea what the mechanism is, so if anyone has it please do share. Sorry folks.

Report to moderator Logged

dead_rat_organs
Larvae



Posts: 34

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

« **Reply #274 on:** June 16, 2020, 12:43:32 AM »

Quote

While we’re here on this old thread, i wanna ask, would you get higher yields if you converted the aldehyde to an oxime in the presence of sodium acetate as a buffer, and then purified the oxime and did a beckmann rearrangement on that instead of a one pot synthesis? It seems to me that this whole aldehyde to amide one pot thing is useful and all, but wouldn’t it be much cleaner and more reliable to do it step by step like a traditional synthesis, purifying the products of a reaction before going onto the next step?

Vanillyl amine can be made by reacting vanillin oxime with Ammonium formate and zinc, and with 35% yield hxxps://youtu.be/tmCGM6G5wjc

The yield would be even higher had he washed his product with cold ethanol.

Could one do something similar with helional? Without all the mishaps of this one pot method? Plus, you wouldn’t have to do a Hoffman on the amide, you’d go strait from the oxime to the amine.

« Last Edit: June 16, 2020, 12:49:52 AM by dead_rat_organs »

Report to moderator Logged

carl
Global Moderator
Founding Wasp

Posts: 5,626

circular pastry filled with

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

« **Reply #275 on:** June 16, 2020, 12:58:41 AM »

Quote

Quote from: dead_rat_organs on June 16, 2020, 12:43:32 AM

> Could one do something similar with helional? Without all the mishaps of this one pot method? Plus, you wouldn’t have to do a Hoffman on the amide, you’d go strait from the oxime to the amine.

I think you would find your answer in the beckman thread.
Besides that, what reduction of the oxime to the amine would give you a one

hazelnut crime

carbon shorter amine?
Count the carbons of helional and MDA

Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information

Quote

> Real bees just hear the buzzing and it doesn´t ever stop. Ever.

bsmathers

Pupae

Posts: 56

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #276 on:** December 05, 2020, 03:45:35 AM »

So I gave the reaction a go on a 10 gram scale. 55ml of DMSO was used as solvent, and the peroxide addition above 70 C went smoothly for the most part. However after filtering off the precipitated material 26 (!) grams of crude product was obtained. Clearly this is mostly dimethyl sulfone, but I am unsure about how best to separate the amide from it. Does anyone have any suggestions?

Report to moderator Logged

carl

Global Moderator
Founding Wasp

Posts: 5,626

circular pastry filled with hazelnut crime

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #277 on:** December 05, 2020, 10:26:33 AM »

Simply with water, this dissolves the MSM but not the amide.

Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information

Quote

> Real bees just hear the buzzing and it doesn´t ever stop. Ever.

bsmathers

Pupae

Posts: 56

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #278 on:** December 05, 2020, 05:39:05 PM »

Approximately how soluble is the amide in room temperature water? I haven't been able to find real solubility data for the sulfone either, but it seems to be around 150-200 grams per liter at ~20 C according to the little info I could find. Is this figure accurate?

« *Last Edit: December 05, 2020, 05:44:07 PM by bsmathers* »

Report to moderator
Logged

Penile Assetate
Pupae
Posts: 68

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #279 on:** December 05, 2020, 05:48:07 PM »

Quote from: bsmathers on December 05, 2020, 05:39:05 PM

> Approximately how soluble is the amide in room temperature water? I haven't been able to find real solubility data for the sulfone, but it seems to be around 150-200 grams per liter at ~20 C according to the little info I could find.

That might be a stretch. The amide is only sparingly soluble in water at rt. From a penis' experience with the material, one would have a difficult time dissolving that much in 1L. But if it's boiling, you will have no problem. Just use an excess of water at a rolling boil, the material will dissolve fine and crystallize out upon standing with little effort or external cooling required.

Report to moderator
Logged

big mac
5MackO DMT
Founding Wasp

Posts: 531

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #280 on:** December 05, 2020, 06:54:54 PM »

Quote from: Penile Assetate on December 05, 2020, 05:48:07 PM

> **Quote from: bsmathers on December 05, 2020, 05:39:05 PM**
>
> > Approximately how soluble is the amide in room temperature water? I haven't been able to find real solubility data for the sulfone, but it seems to be around 150-200 grams per liter at ~20 C according to the little info I could find.
>
> That might be a stretch. The amide is only sparingly soluble in water at rt. From a penis' experience with the material, one would have a difficult time dissolving that much in 1L. But if it's boiling, you will have no problem. Just use an excess of water at a rolling boil, the material will dissolve fine and crystallize out upon standing with little effort or external cooling required.

I think he means what's the solubility of dimethyl sulfone, not the amide. He started another sentence.

One site gives the solubility of dimethyl sulfone 55.8 g/dm3, although another one gives 150g/dm3 20C. I don't know if it does really matter, the solubility is indeed high. What surprises me that these two are totally different data. Maybe the one that gives 55.8g/dm3 is about different temp.

Report to moderator
Logged

Quote from: Johnathan Ferrous on May 06, 2021, 09:06:39 PM

> Big man, Big Mac.

bsmathers
Pupae

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #281 on:** December 05, 2020,

Posts: 56

07:29:19 PM »

> **Quote from: big mac on December 05, 2020, 06:54:54 PM**
>
> > **Quote from: Penile Assetate on December 05, 2020, 05:48:07 PM**
> >
> > > **Quote from: bsmathers on December 05, 2020, 05:39:05 PM**
> > >
> > > Approximately how soluble is the amide in room temperature water? I haven't been able to find real solubility data for the sulfone, but it seems to be around 150-200 grams per liter at ~20 C according to the little info I could find.
> >
> > That might be a stretch. The amide is only sparingly soluble in water at rt. From a penis' experience with the material, one would have a difficult time dissolving that much in 1L. But if it's boiling, you will have no problem. Just use an excess of water at a rolling boil, the material will dissolve fine and crystallize out upon standing with little effort or external cooling required.
>
> I think he means what's the solubility of dimethyl sulfone, not the amide. He started another sentence.
>
> One site gives the solubility of dimethyl sulfone 55.8 g/dm3, although another one gives 150g/dm3 20C. I don't know if it does really matter, the solubility is indeed high. What surprises me that these two are totally different data. Maybe the one that gives 55.8g/dm3 is about different temp.

big mac is right; I must have been unclear. I was asking about the solubility of the desired helionamide product in room temperature water, and gave some figures I found for the solubility of dimethyl sulfone.

I'm not sure how much I trust those solubility figures: I've seen numbers ranging from 1000g/L to 55g/L for the solubility of dimethyl sulfone in water. I think the lower figure comes from some computational chemistry software and not an actual experiment

I found this patent (https://patents.google.com/patent/US4296130A/en) which gives a figure of 339g/L at 26 C, and I'd be inclined to believe it in light of the complete lack of usable information on the topic.

The entirety of the crude material wasdissolved in 150ml of hot water, and some crystals separated out of the mixture upon cooling. How much amide would you expect is left in the water at 20 C?

« *Last Edit: November 02, 2023, 02:43:33 PM by Sawdust and Honey* » Report to moderator

Logged

bsmathers

Pupae

Posts: 56

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #282 on:** December 06, 2020, 11:22:08 PM »

I evaporated down the filtrate to 50ml and chilled it to 25 C: no crystals were obtained. Meanwhile, the crystals were dried at 80 C: I obtained 5.5 grams of light brown solid which is presumably helionamide.

I'm not sure where the rest of my aldehyde went. I presumed that a DCM wash of the post-peroxide reaction mix would not be necessary due to the reduced quantity of DMSO, but I'm guessing that that was a mistake. Does anyone have any thoughts?

Finally, what is the lowest DMSO:aldehyde ratio I could operate with in this reaction? I'd prefer to avoid DCM rinses if possible.

Report to moderator Logged

aes256

Founding Wasp

Posts: 841

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #283 on:** December 07, 2020, 01:56:19 AM »

you really don't want to skimp on the DMSO with this reaction otherwise you get solubility issues (product crashing out necessitating redissolution) and temperature control issues (potential for thermal runaway). You most definitely can't skimp on solvent if you're trying to scale up >100 g aldehyde. That is if you're dumping the hydroxylamine in all at once - temp control is very important in that case. Otherwise, if you add it portionwise you have better control.

You really don't need to get creative with this reaction at all! If you follow it to the tee you can't possibly get poor yields. The only other factors I could foresee contributing to poor yields are impure reagents/solvents/precursors, and inadequate technique.

Report to moderator Logged

Quote from: Eleusis

> However, I had serious misgivings about sharing because my quest was one for knowledge and experience while, I knew, for most others it would be for purely economic reasons.

Quote

> He hardly ever spoke of magic, and when he did it was like a history lesson and no one could bear to listen to him.

Quote from: Orange

> you can always dont make things.
> but u cant always make things happen.

bsmathers

Pupae

Posts: 56

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #284 on:** December 07, 2020, 06:11:50 AM »

I don't have a particular interest in scaling this reaction up beyond 10g trials. Do temperature issues appear even at this small scale? I haven't noticed any particular exotherm in a hot water bath.

I followed pyrrolidin's procedure exactly with 3 modifications: I used a smaller DMSO volume as suggested by unlikely_username, I ran the peroxide addition at 70-85 C, and I separated out the product by cooling the reaction mixture and filtering. Would any of these changes pose an issue? I noticed no separation of nitrile during the peroxide addition. My reagents are from a trusted source, although my helional might be somewhat old and oxidized by now.

Report to moderator Logged

Sawdust and Honey

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES

Quote

Founding Wasp

Posts: 1,624

INTO AMIDES results

« **Reply #285 on:** February 25, 2021, 08:44:53 PM »

I've searched through this thread a couple of times and can't come to a final conclusion - what solvent/solvent system is best for recrystallizing the amide?

Report to moderator Logged

End of the road. Nothing to do, no hope of things getting better.
Sounds like Saturday night at my house.

carl

Global Moderator
Founding Wasp

Posts: 5,626

circular pastry filled with hazelnut crime

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #286 on:** February 25, 2021, 08:56:23 PM »

Aqueous ethanol, but I can't tell you the percentage.
Its soluble in ethanol, but not in water.
Eighty percent maybe? I forgot about it, sorry.
Just to give you a hint.

So you made it to the amide?
Great to hear!
Add it to the hofmann dissolved in dioxane(but slowly), this increases the yield for a good part.

Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information

Quote

> Real bees just hear the buzzing and it doesn´t ever stop. Ever.

Sawdust and Honey

Founding Wasp

Posts: 1,624

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #287 on:** February 25, 2021, 09:18:43 PM »

Well, I followed the "Igor's" procedure, but had two fuckups. At the beggining of 1st stage (hydroxylamine + helional) I inserted the RBF into a hot water bath, which turned out to be later a terrible decision. For around 2 minutes the mixture was 110-120C, which is 20-30 degrees higher than recommended. Instead of a water bath for a scale of 50g of helional simple heating on a hotplate (I used the 150C setting, turned out it was perfect for keeping the mixture at a steady 89-91C for the entire 90 minutes) is much better.

In the addition of peroxide I accidentaly opened the stopcock of dripping funnel in such a way that a couple mls of the peroxide fell into the mixture at once. This caused the temperature to get up after a very short induction period and the mixture's temperature got up to 120C. There was a ton of bubbles, but luckily I used a 1L beaker and so nothing boiled over. After that, everything went very smoothly. I had to stand there for 2 hours adding the

300mls of peroxide drop by drop, stopping every 3 minutes or so to let the mixture cool down. The reaction dies below ~66C and one has to heat it back up in order for the exotherm to appear once again. Therefore, to anyone attempting this, **DO NOT ADD MORE PEROXIDE IF THERE IS NO EXOTHERM**, as once you heat it back up your ceiling will have to take an alkaline, hot bath. I used a large pot filled with water to keep the reaction mixture in the right temperature range during H_2O_2 addition (68-73C). A sensitive thermocouple is great for this. Had to change the water once as it's such a great heatsink it was hot-tub level hot after half an hour.

I have to add that after adding 70-80% of the peroxide the exotherm is much less prevelent and the drip rate can be slowly increased.

Probably due to these two mistakes my final reaction mixture was the color of a healthy-man's-piss yellow, instead of very light yellow as described in the procedure.

The amide is crystallizing in the refrigerator right now. Attaching photos...

Also, carl, could You please point me to a right direction with the dioxane? Never before have I assosciated dioxane with the Hoffman rearrangement. I have some pretty pure NaDCC and was planning to follow swoner's experiment as described here: https://www.thevespiary.org/talk/index.php?topic=17570.msg54197669#msg54197669. I am a bit scared about MDA-Cl formation, though. Are there any reliable ways not to get poisoned by it?

foto_no_exif (8).jpg (128.28 kB, 2731x2048 - viewed 128 times.)

foto_no_exif (7).jpg (31.97 kB, 1280x720 - viewed 114 times.)

« *Last Edit: February 25, 2021, 09:23:57 PM by Sawdust and Honey* » Report to moderator Logged

End of the road. Nothing to do, no hope of things getting better.
Sounds like Saturday night at my house.

carl
Global Moderator
Founding Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #288 on:** February 25, 2021, 09:22:20 PM »

Noice!

Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

Posts: 5,626

circular pastry filled with hazelnut crime

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information
>
> **Quote**
>
> Real bees just hear the buzzing and it doesn´t ever stop. Ever.

Sawdust and Honey

Founding Wasp

Posts: 1,624

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #289 on:** February 25, 2021, 09:26:11 PM »

Whoops, wanted to avoid doubleposting so I edited my original post with the amide's photos. Curious about the dioxane thing.

Report to moderator Logged

End of the road. Nothing to do, no hope of things getting better.
Sounds like Saturday night at my house.

carl

Global Moderator
Founding Wasp

Posts: 5,626

circular pastry filled with hazelnut crime

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #290 on:** February 25, 2021, 09:30:49 PM »

There is a paper from the seventies(I think), regarding both the hydrocinnamides with either 3,4-dimethoxy and 3,4-methylenedioxy substitution, if you search a bit around on here, you'll find them.
There they use dioxane to add the amides to the hofmann solution.
Very interesting read!
Its the one where they do the reduction of the cinnamal derivatives to the hydrocinnamal derivatives with sodium amalgam, you'll instantly recognise them if you watch out for this.

Report to moderator Logged

> **Quote from: Moriarty on September 08, 2015, 05:10:02 AM**
>
> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information
>
> **Quote**
>
> Real bees just hear the buzzing and it doesn´t ever stop. Ever.

Sawdust and Honey

Founding Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #291 on:** February 25, 2021, 10:40:38 PM »

I've been searching for the last 30 minutes or so without much luck. I did stumble upon the interesting NBS/KOH paper that I posted in the other thread, but nothing at all regarding dioxane. I'll edit this post if I find anything, but if you could remember what thread to look in I'd be in debt.

Posts: 1,624

Report to moderator Logged

End of the road. Nothing to do, no hope of things getting better.
Sounds like Saturday night at my house.

carl

Global Moderator
Founding Wasp

Posts: 5,626

circular pastry filled with hazelnut crime

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #292 on:** February 25, 2021, 10:44:17 PM »

I really don't know, I have the paper somewhere...
Please try to look at the references of this erowid post, I think there it was: https://erowid.org/archive/rhodium/chemistry/alpha-methylhydrocinnamic.html

I'm sorry, but I have it on the other computer and I know exactly where it is, I'll try to dig it out for you tomorrow alright?
If not, at least over the course of the weekend... if you hear nothing from me, poke me again to do it ok?

Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information

Quote

> Real bees just hear the buzzing and it doesn´t ever stop. Ever.

Sawdust and Honey

Founding Wasp

Posts: 1,624

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #293 on:** February 26, 2021, 10:32:35 AM »

The product is admittedly yellow. Hopefully that will get better after recrystallizations. I am planning to first carry out a boiling water recryst to get rid of any DMSO or MSM left and then an ethanol recryst to purify the product further.

photo_2021-02-26_11-30-40.jpg (105.66 kB, 1280x720 - viewed 158 times.)

Report to moderator Logged

End of the road. Nothing to do, no hope of things getting better.
Sounds like Saturday night at my house.

Stormzyy

Pupae

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

Posts: 78

« **Reply #294 on:** February 26, 2021, 11:18:21 AM »

Nice one! Glad to see some people having this reaction working. Any first report on your yield before recrystallizations?

Report to moderator Logged

Sawdust and Honey

Founding Wasp

Posts: 1,624

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #295 on:** February 26, 2021, 11:30:42 AM »

Quote from: Stormzyy on February 26, 2021, 11:18:21 AM

> Nice one! Glad to see some people having this reaction working. Any first report on your yield before recrystallizations?

Unluckily I don't have any easy ways of measuring the weight now, as I only use 200g and 100g scales for everyday preparations. But there is certainly a lot of the product, probably more than 100%. So it must be contaminated and I'll report the final yield after recrystallizations, as it really is the only one that matters.

Report to moderator Logged

End of the road. Nothing to do, no hope of things getting better.
Sounds like Saturday night at my house.

carl

Global Moderator
Founding Wasp

Posts: 5,626

circular pastry filled with hazelnut crime

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #296 on:** February 26, 2021, 11:56:18 AM »

Its full of MSM which can be washed out with water.

Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information
>
> **Quote**
>
> > Real bees just hear the buzzing and it doesn´t ever stop. Ever.

skektek

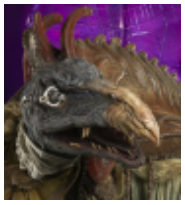
Subordinate Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #297 on:** February 26, 2021, 11:57:04 AM »

I once found a great way to crystallize heliamide by mistake.



Posts: 165

Distiller of Gelflings

it made wonderful needle crystals that were white as snow from the horrid brown beckman.

after finishing my beckman I stripped the xylene off the stuff till it was at the right temp and then just dumped a heap of water over it.

the whole product dissolved leaving an oily layer on top.

leaving the pot to cool the entire pot was filled with wonderful needles and the oil that contained all of the colour stayed ontop of the water.

Report to moderator Logged

GIVE ME ESSENCE

BrominePirate

Pupae

Posts: 54

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #298 on:** February 26, 2021, 03:51:45 PM »

Look at this:

https://zero.sci-hub.se/2105/9e09e89c768131ee27a733c82e5d2b8a/mild-and-efficient-conversion-of-nitriles-to-amides-with-basic-u-1993.pdf

Report to moderator Logged

aes256

Founding Wasp

Posts: 841

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #299 on:** February 27, 2021, 09:59:41 AM »

Quote from: Sawdust and Honey on February 26, 2021, 10:32:35 AM

> I am planning to first carry out a **boiling water recryst to get rid of any DMSO or MSM left** and then an ethanol recryst to purify the product further.

This is a very good idea and should be the first purification step after removing the impure product from the reaction mixture. Residual DMSO can really thwart later attempts at recrystallisation and drop yield dramatically.

Report to moderator Logged

Quote from: Eleusis

> However, I had serious misgivings about sharing because my quest was one for knowledge and experience while, I knew, for most others it would be for purely economic reasons.

Quote

> He hardly ever spoke of magic, and when he did it was like a history lesson and no one could bear to listen to him.

Quote from: Orange

> you can always dont make things.
> but u cant always make things happen.

aes256

Re: FACILE ONE-POT CONVERSION

Quote

Founding Wasp

Posts: 841

OF ALDEHYDES INTO AMIDES results

« **Reply #300 on:** February 27, 2021, 10:01:49 AM »

Quote from: carl on February 25, 2021, 08:56:23 PM

> Add it to the hofmann dissolved in dioxane(but slowly), this increases the yield for a good part.

I remember hearing about this ages ago when this thread was really active but I don't recall anyone trying it and reporting mind blowing yield increases. Realistically most folks were getting around the 60% mark of high purity product - does the better solvation of dioxane really increase the yield much above this?

Report to moderator Logged

Quote from: Eleusis

> However, I had serious misgivings about sharing because my quest was one for knowledge and experience while, I knew, for most others it would be for purely economic reasons.

Quote

> He hardly ever spoke of magic, and when he did it was like a history lesson and no one could bear to listen to him.

Quote from: Orange

> you can always dont make things.
> but u cant always make things happen.

Sawdust and Honey

Founding Wasp

Posts: 1,624

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #301 on:** February 27, 2021, 10:25:40 AM »

Well, a couple of water recrystallizations were done and I'm left with 20g of dry, off-white amide and arund 10g of still a bit wet, yellowish one.
Ethanol/water recrystallization didn't do much. At first when I tried it all of the product crashed out after adding a crystallization-inducing crystal and formed a thick paste. Then, less ethanol was used and the product crystallized pretty nicely. Unluckily it still had a yellow tint and the smell of melon is persistent, but mild.
I think I'm going to use it as-is, I don't have any other ideas for recrystallization.

Report to moderator Logged

End of the road. Nothing to do, no hope of things getting better.
Sounds like Saturday night at my house.

aes256

Founding Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #302 on:** March 01, 2021, 09:37:33 PM »

You definitely want very clean amide, it makes quite a difference to the end

Posts: 841

product coming out of the Hofmann.

Have you tried washing the amide on the filter? Wet the amide with minimal amount of ethanol/water solution, let sit and/or mix through with a stir rod for a few minutes, then apply suction to pull the solvent through. Repeat until the solvent coming through is clear. You may end up with a bit of product in that ethanol/water mixture but it will be minimal and thus easier to purify or add to subsequent batches to recrystallise.

Report to moderator Logged

Quote from: Eleusis

> However, I had serious misgivings about sharing because my quest was one for knowledge and experience while, I knew, for most others it would be for purely economic reasons.

Quote

> He hardly ever spoke of magic, and when he did it was like a history lesson and no one could bear to listen to him.

Quote from: Orange

> you can always dont make things.
> but u cant always make things happen.

Sawdust and Honey

Founding Wasp

Posts: 1,624

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #303 on:** March 01, 2021, 09:41:16 PM »

Yes, I washed it with water multiple times. I should try washing it with ethanol/water too, sure.

Report to moderator Logged

End of the road. Nothing to do, no hope of things getting better.
Sounds like Saturday night at my house.

carl

Global Moderator
Founding Wasp

Posts: 5,626

circular pastry filled with hazelnut crime

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #304 on:** March 01, 2021, 09:43:07 PM »

Quote from: aes256 on February 27, 2021, 10:01:49 AM

> **Quote from: carl on February 25, 2021, 08:56:23 PM**
>
> > Add it to the hofmann dissolved in dioxane(but slowly), this increases the yield for a good part.
>
> I remember hearing about this ages ago when this thread was really active but I don't recall anyone trying it and reporting mind blowing yield increases. Realistically most folks were getting around the 60% mark of high purity product - does the better solvation of dioxane really increase the yield much above this?

One of the known issues is, that the addition of helionamide dissolved in dioxane can be very exothermic, including frothing and all.

And no... I'll pick the paper out tomorrow if I can get to it :

Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information

Quote

> Real bees just hear the buzzing and it doesn´t ever stop. Ever.

Mustacho

Subordinate Wasp

Posts: 161

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #305 on:** July 25, 2021, 07:40:14 AM »

After reading through the whole thread i summed it up to this:

100g Heli run
Mix 400 ml DMSO and 36.93g Hydroxylamine HCL, then add 100g heli and the last 100ml of DMSO.
Heat for 90 minutes at 85-90°C on hotpate with good stirring.
Turn off heating and when temp has gone down to about 70°C, add 15% NaOH solution carefully until pH is about 10, try keep temp around 70-80°C.
Then at 65-70°C start dripping 600ml 30% H2O2 very carefully. The H2O2 is pre-basified to pH 7-7.5 with 15% NaOH, keep a ice-bath ready if temps rise fast to above 95°C and periodically measure the pH to confirm it stays between pH 8-10.
If pH falls below 8 add 15% NaOH till pH is about 10, the temps should be about 80-95°C during the H2O2 addition.
When all 600ml H2O2 has been added continue stir until gas evolution and exothermia had ceased.
When temps have decreased to about 50°C one have 2 choices,
One could pour the content into a large beaker/pyrex dish, put into refrigerator and let it sit overnight to form crystals,
or one could dump it into ice cold water and then immediately vacuum filter the crystals.
I think i go with slow crystallization overnight.
Then vacuum filter the crystals and wash them on the funnel with distilled water.
Re-crystallization from water if it seem needed.

Do i need to pre-distill my heli before the conversion to the amide?
Im little worried about the soyuz rocket, but with pre-basified H2O2 and very careful addition at correct temp and pH i hope no rocket takes off.
Some ice-water will be prepared if cooling is needed.

This thread hasnt been active since February, is there a better way to the amide?
I have searched and there is many ways to make the conversion.

Report to moderator Logged

aes256

Founding Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #306 on:** July 26, 2021, 01:17:22 PM »

Posts: 841

Yup, that's pretty much it.

Personally, I wouldn't bother waiting for it to crystallise overnight because you're going to recrystallise it anyway to get it bright white and sparkly. Just dump into cold water, pop it in the fridge to cool it right down, then vacuum filter and suck dry at the pump.

re-xtal from azeotropic EtOH, vacuum filter and suck dry. Bonza

Just be careful with that first vac filter because you may still have residual DMSO stuck to the crystals. Water is miscible with DMSO so if you try to wash the crystals with water you might dissolve some of your amide. Time may be wasted chasing bits of dissolved amide around in washings. Best to really get that initial precipitate from the reaction mixture dry then re-xtal in EtOH.

I only suggest azeo EtOH because it's generally so cheap and available, worldwide. Something about that bit of water in there helps the amide to crystallise out readily too. As always, your mileage may vary. Workup is where the work goes. Good luck!

Report to moderator Logged

Quote from: Eleusis

> However, I had serious misgivings about sharing because my quest was one for knowledge and experience while, I knew, for most others it would be for purely economic reasons.

Quote

> He hardly ever spoke of magic, and when he did it was like a history lesson and no one could bear to listen to him.

Quote from: Orange

> you can always dont make things.
> but u cant always make things happen.

Mustacho

Subordinate Wasp

Posts: 161

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote

« **Reply #307 on:** July 27, 2021, 05:08:07 AM »

Thank you.

I have most solvents but not azeotropic ethanol.
Absolute ethanol i have but i rather save that for something else.
Can IPA be used for the re-crystallization?
I can order some 99% ethanol denatured with 1% MEK and 1% IPA and dilute to the azeotrope 95.6% or a bit more but will the added MEK/IPA cause any problems?
Some denatured ethanol could be useful to have for other things also but i have to wait for it to be delivered.

Report to moderator Logged

aes256

Founding Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote

« **Reply #308 on:** July 27, 2021, 08:37:36 AM »

Posts: 841

IPA is fine, as is MeOH.

Report to moderator Logged

Quote from: Eleusis

> However, I had serious misgivings about sharing because my quest was one for knowledge and experience while, I knew, for most others it would be for purely economic reasons.

Quote

> He hardly ever spoke of magic, and when he did it was like a history lesson and no one could bear to listen to him.

Quote from: Orange

> you can always dont make things.
> but u cant always make things happen.

superlative

Subordinate Wasp

Posts: 140

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #309 on:** August 14, 2021, 05:57:39 PM »

I have noticed differences in the crystals from different yeilds.

From the Beckmann the needles were small like snowflakes, and not solvable in water unless it was boiling, but from the this method i sometimes get bigger crystals, long shards.... could this be MSM? Is this because the nitrile=>amide formation failed somehow? I have sometimes noticed the color go dark brown instead of amber, seem to be pH related. Is my Hydroxylamine HCl wet? Seem very hygroscopic, but i dont like the idea of heating it to get it dry, should be safe as the salt, but....

Would Acetone work to separate a squeeky clean amide from MSM and whatever unwanted bi products?

Can anyone give me a pointer or two?

« *Last Edit: August 14, 2021, 06:14:05 PM by superlative* » Report to moderator Logged

carl

Global Moderator
Founding Wasp

Posts: 5,626

circular pastry filled with hazelnut crime

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #310 on:** August 19, 2021, 04:19:15 AM »

Quote from: superlative on August 14, 2021, 05:57:39 PM

> I have noticed differences in the crystals from different yeilds.
>
> From the Beckmann the needles were small like snowflakes, and not solvable in water unless it was boiling, but from the this method i sometimes get bigger crystals, long shards.... could this be MSM?

Yeah, long needle like crystals, that sounds about right.
They are water soluble, thus wash the precipitate with water first to remove the MSM, and no worries, the amide is almost insoluble in water anyways.

Quote from: superlative on August 14, 2021, 05:57:39 PM

> Is this because the nitrile=>amide formation failed somehow? I have sometimes noticed the color go dark brown instead of amber, seem to be pH related. Is my Hydroxylamine HCl wet? Seem very hygroscopic, but i dont like the idea of heating it to get it dry, should be safe as the salt, but....

No, no indication that the nitrile oxidation has failed, that has nothing to do with it.
The MSM is produced from the oxidation of the DMSO, so to avoid that, you would need to isolate the nitrile after the reaction with hydroxylammonium chloride in DMSO, by precipitation with water and extraction.
The nitrile is an oil by the way.

If you isolate the nitrile and oxidise that without lots of DMSO present, the reaction will produce much, much less side products, logically.
The other advantage is, that the oxidation is far less vigorous on the isolated nitrile, because much of the violent exothermia stems from the reaction of residual hydroxylamine with H2O2.

So if you take care of these two variables you'll increase your workload a good bit, while at the same time you can also increase the potential yield, purity, and ease of the reaction.
Not to mention that you're going to require less peroxide this way too.

The discoloration you sometimes experience comes from you not watching the temperature closely, if it gets dark brown instead of amber you haven't paid proper attention and allowed it to get too hot for too long.
This definitely reduces your yield, thats for sure.

« Last Edit: August 19, 2021, 04:21:40 AM by carl » Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information

Quote

> Real bees just hear the buzzing and it doesn´t ever stop. Ever.

carl
Global Moderator
Founding Wasp

Posts: 5,626

circular pastry filled with hazelnut crime

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #311 on:** August 25, 2021, 04:07:49 AM »

I was looking into making piperonylinonitrile and came across this(and two other methods, but the recognising spark didn't went off the first times)
hxxps://patents.google.com/patent/CN106518835A/en
You'll notice, at last when you see where this posted in, that it bears a striking resemblance, its just a bit hotter and ran in DMF, but else?
I would love to make helionamide just the same except with DMF instead of DMSO
Of course it does look familiar, as it is of course the same reaction, and thus:
-4,8g hydroxylammonium chloride, crudely crushed and then dissolved under warming and stirring in -10ml DMSO, and them given to, the beaker rinsed too, a flask containing
-8,1g of piperonal(56mmol) in 5ml DMSO.

Kept this at an internal temperature of 85-90°C under stirring, then left it to cool to RT. and later added 150ml of water under stirring.
Later cooled the mix in the freezer for a short while, the precipitate got filtered, 2x20ml h2o washes were done and it was dried with moderate heating.
The crude crystals, having a stench composed of mostly dimethyl sulfide with some piperonal note, and weighed 7,63g(92,6%, and very likely free from MSM.

When all of that were taken up in 10ml 1-propanol*, a few ml's of hot water, around 3-4ml in total, were added dropwise to the hot and stirred mixture, then left to cool, and when I saw it was a complete mass, I addedd ~12ml of 50% n-propanol under manual stirring, to loosen everything up,
then got it cooled down properly before for the filtration.

Anyways, filtered it off and washed it with a few ml's of freezer cold propanol, which was not very smart, as it pulled some product through, it should have been half diluted with water as well.
After aid drying, it weighed 6,48g, 44mmol, which corresponds to 78,6% of the theory.
Checked the melting point(**) with the proper thermometer and in a different, less "demanding" state of mind....
And it melted sharply at 90-91°C, which would be consisting with the literature , 91-93°C.

What this stuff is useful for?
Well it would give a ketone in a grignard reaction, in this case with EtMgX, you would get MD-propiophenone after the hydrolysis.
The precursor for the two interesting benzylamine ALPHA and M-ALPHA in Pihkal, and of course, it is also the precursor for methylone/bk-MDMA, an empathogenic cathinone which was quite widespread a few yeras ago.
One of those few, hardly any others besides it and the classics from Pihkal, which definitely sticks out with the same unique experience.

This is said to be one of the cleanest routes for ketones via grignard, and we'll see. so far the nitrile seems already pretty clean, hope that is a trend that continues.

I have also attempted that reaction with 50mmol of benzaldehyde, and no excess of hydroxylamine HCl, just an equimolar quantity in that trial, and less DMSO of course too.
The reaction was allowed to run a bit longer, and then I filled the flask up until the 100ml mark with cold water at RT, the product layer settled on top and still smells strongly of benzaldehyde.

I guess thats normal, as the MD-benzonitrile had only a faint piperonal remiscing odor, which I could notice at first when melting several grams of it, but isn't even nearly as strongly smelling in solid form.
One detail which appears to be not typical piperonal, is the roasted nut scent

*n-propanol was used because it was there and since its not very costly.
The moment it to smell, its odor started to fill the air, piperonal like, but more like piperonal with a dark note, and when a molten liquid, certain undertone remiscent of roasted nuts or such
But ethanol works far better for this purpose here, just had none left.

** yes, in the other thread

Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information

Quote

Real bees just hear the buzzing and it doesn´t ever stop. Ever.

Sawdust and Honey

Founding Wasp

Posts: 1,624

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #312 on:** August 25, 2021, 08:54:02 PM »

Regarding isolating the nitrile - what solvent system is best for the subsequent oxidation?
Dr Ape mentioned 50/50 MeOH/water, has anyone tried it or used any other solvents?

Report to moderator Logged

End of the road. Nothing to do, no hope of things getting better.
Sounds like Saturday night at my house.

Sawdust and Honey

Founding Wasp

Posts: 1,624

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #313 on:** September 07, 2021, 04:37:22 PM »

The nitrile was isolated by dissolving the DMSO RM in water. A few brine washes later the oil was distilled under vacuum to afford a viscous yellow oil. This was oxidized with basic peroxide with methanol and around 70% in yield was obtained. Apart from hydroxyloamine safety concerns I can't say that isolating the nitrile is worth the effort. The upside is surely a lack of any MSM to clean the amide from.

Report to moderator Logged

End of the road. Nothing to do, no hope of things getting better.
Sounds like Saturday night at my house.

Newton2.0

Subordinate Wasp

Posts: 186

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #314 on:** September 23, 2021, 07:59:58 PM »

Those ALPHAs look very interesting! Would be curious to see if the subjective effects justify using an expensive precursor and whether or not pyrrolidone analogues would produce a corresponding effect similar to their positional isomer cousins.

Personally, I would love a simple route to bk-MDMA! Such a cool compound

Report to moderator Logged

Mustache Rides: $5

carl

Re: FACILE ONE-POT CONVERSION

Quote

Global Moderator
Founding Wasp

Posts: 5,626

circular pastry filled with hazelnut crime

OF ALDEHYDES INTO AMIDES results

« **Reply #315 on:** September 23, 2021, 08:45:54 PM »

Quote from: Newton2.0 on September 23, 2021, 07:59:58 PM

> Personally, I would love a simple route to bk-MDMA! Such a cool compound

Working on it, give me some time though
Following Kinetic's droppings on it, while also trying to improve it.
Tiny amounts have been made, but far from being optimised.

Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information

Quote

> Real bees just hear the buzzing and it doesn´t ever stop. Ever.

sparklebags
Dominant Wasp

Posts: 457

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #316 on:** October 03, 2021, 03:33:29 PM »

A few things. Ran this the other day with 4ml of DMSO per gram of aldehyde. Had stunning results - both purity and yield. Tried again today with a slightly scaled up version. Unfortunately the temp. during the H202 addition stayed around 70*, resulting reaction mixture never turned pale yellow, stayed dark red. Now I have, what I assume, is a mixture with oily blobs of nitrile. Is there anyway to salvage this?

Report to moderator Logged

Sawdust and Honey
Founding Wasp

Posts: 1,624

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #317 on:** October 03, 2021, 03:46:43 PM »

First of all, was the pH right? It's got to be basic to activate the peroxide and allow the oxidation to happen. Second of all, was there any exotherm? If not you're screwed, you've got a solution of peroxide that could activate if you heat it up too much and lead to a terrible runaway. I'd quench the peroxide with something stoichiometrical (eg. thiosulfate) and then try once again properly.

Report to moderator Logged

End of the road. Nothing to do, no hope of things getting better.
Sounds like Saturday night at my house.

sparklebags
Dominant Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

Posts: 457

« **Reply #318 on:** October 03, 2021, 04:17:13 PM »

Ph was kept right at 10. KOH solution was added to H202 before addition. There was exothermia, it just never got that nice clear color I usually get. The amide is soluble in DCM correct? I could extract the lot with DCM, evaporate off DCM, crash with water?

Report to moderator Logged

Sawdust and Honey

Founding Wasp

Posts: 1,624

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #319 on:** October 03, 2021, 04:30:39 PM »

Possibly, but it should crash out by itself. Maybe try taking an aliquot of your reaction mixture and diluting it with water and cooling it down? If nothing crashes out then you've got no amide.

Report to moderator Logged

End of the road. Nothing to do, no hope of things getting better.
Sounds like Saturday night at my house.

sparklebags

Dominant Wasp

Posts: 457

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #320 on:** October 03, 2021, 04:40:35 PM »

Yeah I just get red powdery not crystalline junk. I will let it cool to close to 0* and see. The DCM extraction left 3 layers, top layer is the typical IPA beer color, middle layer is rust colored gunk, bottom layer is fairly clear DCM. Dang it.

Report to moderator Logged

carl

Global Moderator
Founding Wasp

Posts: 5,626

circular pastry filled with hazelnut crime

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #321 on:** October 03, 2021, 04:41:50 PM »

Quote from: Sawdust and Honey on October 03, 2021, 03:46:43 PM

> First of all, was the pH right? It's got to be basic to activate the peroxide and allow the oxidation to happen. Second of all, was there any exotherm? If not you're screwed, you've got a solution of peroxide that could activate if you heat it up too much and lead to a terrible runaway. I'd quench the peroxide with something stoichiometrical (eg. thiosulfate) and then try once again properly.

Yeah or just add lots of water instead and extract the nitrile with DCM or the like, much easier and faster.
Its not soluble in water anyways.

Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information

Quote

> Real bees just hear the buzzing and it doesn´t ever stop. Ever.

sparklebags
Dominant Wasp
Posts: 457

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #322 on:** October 03, 2021, 04:56:28 PM »

Quote from: carl on October 03, 2021, 04:41:50 PM

> **Quote from: Sawdust and Honey on October 03, 2021, 03:46:43 PM**
>
> > First of all, was the pH right? It's got to be basic to activate the peroxide and allow the oxidation to happen. Second of all, was there any exotherm? If not you're screwed, you've got a solution of peroxide that could activate if you heat it up too much and lead to a terrible runaway. I'd quench the peroxide with something stoichiometrical (eg. thiosulfate) and then try once again properly.
>
> Yeah or just add lots of water instead and extract the nitrile with DCM or the like, much easier and faster.
> Its not soluble in water anyways.

Say, twice the reaction volume with water. Extract the nitrile with DCM. Evaporation of the DCM, crash that out with cold water?

Report to moderator Logged

carl
Global Moderator
Founding Wasp

Posts: 5,626
circular pastry filled with hazelnut crime

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #323 on:** October 03, 2021, 05:42:43 PM »

Twice, no an excess, really an excess, like in excessively partying or such.
Do you want to get the peroxide out or not?
I don't know how much volume we're talking about here, but I would say as much as is still comfortable to work with.
Sufficiently enough, you will notice when its enough.

Quote from: sparklebags on October 03, 2021, 04:56:28 PM

> Say, twice the reaction volume with water. Extract the nitrile with DCM. Evaporation of the DCM, crash that out with cold water?

I'll ask you again, do you want to get rid of it or do you want to keep any peroxide in there?
Theres a little bit more in between to do, and I really recommend not to skip that

But I am sure you just left that out of convenience

Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information

Quote

Real bees just hear the buzzing and it doesn´t ever stop. Ever.

---

sparklebags
Dominant Wasp
Posts: 457

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #324 on:** October 03, 2021, 11:49:47 PM »

I have taken a small amount out of the main vessel - say 500ml, added up to 1L of H20, still siting in freezer. Seems it is lost.

Report to moderator Logged

---

sparklebags
Dominant Wasp
Posts: 457

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #325 on:** October 03, 2021, 11:51:34 PM »

Quote from: carl on October 03, 2021, 04:41:50 PM

Quote from: Sawdust and Honey on October 03, 2021, 03:46:43 PM

First of all, was the pH right? It's got to be basic to activate the peroxide and allow the oxidation to happen. Second of all, was there any exotherm? If not you're screwed, you've got a solution of peroxide that could activate if you heat it up too much and lead to a terrible runaway. I'd quench the peroxide with something stoichiometrical (eg. thiosulfate) and then try once again properly.

Yeah or just add lots of water instead and extract the nitrile with DCM or the like, much easier and faster.
Its not soluble in water anyways.

So once the nitrile is extracted with DCM - what's next. When I did extract it with DCM - there were 3 distinct layers, clear beer colored H20 layer, small layer of reddish oily mess, fairly clear DCM on bottom.

Report to moderator Logged

---

aes256
Founding Wasp

Posts: 841

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #326 on:** October 05, 2021, 11:27:38 AM »

Quote from: Sawdust and Honey on September 07, 2021, 04:37:22 PM

The nitrile was isolated by dissolving the DMSO RM in water. A few brine washes later the oil was distilled under vacuum to afford a viscous yellow oil. This was oxidized with basic peroxide with methanol and around 70% in yield was obtained. Apart from hydroxyloamine safety concerns I can't say that isolating the nitrile is worth the effort. The upside is surely a lack of any MSM to clean the amide from.

Was there any less exothermia observed?
Was the total rxn volume reduced? And what ratio of MeOH/H2O was used?

Thanks

Report to moderator Logged

Quote from: Eleusis

> However, I had serious misgivings about sharing because my quest was one for knowledge and experience while, I knew, for most others it would be for purely economic reasons.

Quote

> He hardly ever spoke of magic, and when he did it was like a history lesson and no one could bear to listen to him.

Quote from: Orange

> you can always dont make things.
> but u cant always make things happen.

Sawdust and Honey
Founding Wasp

Posts: 1,624

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #327 on:** October 05, 2021, 11:41:29 AM »

1. Slightly
2. Not much, just by the amount of DMSO that wasn't there.
3. Doesn't matter much, as you have to stir it intensely anyways.

I think the best part about it is that you don't have to worry about MSM (it's pretty irritating to remove as you lose some amide with each recrystalization).

Report to moderator Logged

End of the road. Nothing to do, no hope of things getting better.
Sounds like Saturday night at my house.

aes256
Founding Wasp

Posts: 841

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #328 on:** October 05, 2021, 02:48:45 PM »

cool. I might give that a go, just for the fuck of it.

Report to moderator Logged

Quote from: Eleusis

> However, I had serious misgivings about sharing because my quest was one for knowledge and experience while, I knew, for most others it would be for purely economic reasons.

Quote

> He hardly ever spoke of magic, and when he did it was like a history lesson and no one could bear to listen to him.

Quote from: Orange

> you can always dont make things.
> but u cant always make things happen.

carl
Global Moderator
Founding Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #329 on:** October 05, 2021, 03:20:51

Posts: 5,626

circular pastry filled with hazelnut crime

PM »

Quote from: Sawdust and Honey on October 05, 2021, 11:41:29 AM

> I think the best part about it is that you don't have to worry about MSM (it's pretty irritating to remove as you lose some amide with each recrystalization).

MSM is water soluble and helionamide is not
Just wash it out before.

Report to moderator Logged

Quote from: Moriarty on September 08, 2015, 05:10:02 AM

> I would suggest that you guys share information like it was the last day on Earth. This information slowdown is all because of all that dumb unwillingness to share. That is where the DEA is winning. There goal is you not talking to each other. Let the information flow. I promise we will always be 2 steps ahead of DEA chemists if we just keep sharing information

Quote

> Real bees just hear the buzzing and it doesn´t ever stop. Ever.

sparklebags

Dominant Wasp

Posts: 457

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #330 on:** October 07, 2021, 12:47:21 PM »

Just a bunch of oily goo. Only thing I changed was using KOH and temp ran lower. I'm going with temp was too low to push the reaction.

Report to moderator Logged

sparklebags

Dominant Wasp

Posts: 457

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #331 on:** October 09, 2021, 09:44:16 PM »

Did another run to confirm the ability to lower the amount of DMSO. Interestingly, by accident, I also confirmed that the amount of H202 could be reduced as well. Ran this between 80-88*, ph 10 maintained with NaOH solution, 4ml of DMSO per gram of aldehyde, 5ml of H202 29% per gram of aldehyde. I added 10% H20 after the reaction had completed and cooled to below 50*. Promptly crashing out pure white amide. This was filtered, washed with copious water and is being allowed to dry. I think the amount of H20 is very important in the reaction. Yields obviously can't be measure as it is still wet but looks to be well above 80%, closer to 90%.

Report to moderator Logged

superlative

Subordinate Wasp

Posts: 140

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #332 on:** October 11, 2021, 05:30:02 AM »

Anyone tried to steam distill the nitrile directly from the RM?

Report to moderator Logged

Penile Assetate

Pupae

Posts: 68

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #333 on:** November 18, 2021, 05:33:23 PM »

Quote from: phantograx on October 11, 2018, 01:24:51 PM

> A fairly new paper describing aldehyde to amide with mostly OTC conditions is linked. Very worthwhile of investigation in my opinion.
>
> Convenient metal-free direct oxidative amidation of aldehyde using dibromoisocyanuric acid under mild conditions
> Using dibromoisocyanuric acid in DCM, the acyl halide is formed and then amine and base is used to produce the amide all at room temperature.
>
> TCCA which is usually much more available and OTC should be a suitable substitute for DBI and preform the identical function, as shown in the 2nd paper linked the acyl chloride can be formed.
> Metal-Free Direct Oxidation of Aldehydes to Esters Using TCCA
>
> The paper uses triethylamine as a base but mentions it only had a 1% higher yield than sodium bicarbonate which is interchangeable, and also mentions using no base at all still provided yields "more than 80%" vs 94% with Et3N
>
> Acyl chloride with ammonia should be simple reaction to form the amide however only substituted amines are shown as examples.
>
> The only part that seems potentially non OTC is the DCM which seems fairly essential, i'm not sure on availability in every country but i find it OTC here but i feel might be more difficult to acquire elsewhere.

Question here: Assuming one successfully forms the acyl halide in DCM, could they then subsequently gas the DCM with methylamine to yield the N-methylamide, which would then rearrange into MDMA via Hofmann? Or would the methyl group on the amine play a part in the hofmann and change the end product?

Report to moderator Logged

Sawdust and Honey

Founding Wasp

Posts: 1,624

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #334 on:** November 18, 2021, 05:35:48 PM »

Hofmann rearrangement works only on primary amides.

Report to moderator Logged

End of the road. Nothing to do, no hope of things getting better.
Sounds like Saturday night at my house.

Penile Assetate

Pupae

Posts: 68

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #335 on:** November 18, 2021, 05:40:27 PM »

Don't remind me of the obvious here. I'm trying to make it easy for everyone! Screw the basics!

Well, I'll just keep pursuing the amide -> Methyl carbamate -> MDMA I was

supposed to try many months ago. I've got everything worked out and ready, so I'll update the according thread soon.

Report to moderator Logged

Newton2.0

Subordinate Wasp

Posts: 186

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #336 on:** December 12, 2021, 12:36:57 PM »

My question altogether is that I get a green product amide. I know this or he an issue so I wonder if I should add it back to to flask with xylene + cat. Ni(OAc)2 + the run to completion in hope that the green stuff is unreacted aldoxime. It isn't coming out with H2O washes....common for removing Ni2.

I will attempt tomorrow because I need to start getting toy laundry list of reactions and products.

Thank you!

Report to moderator Logged

Mustache Rides: $5

Mrbovinejony

Founding Wasp

Posts: 1,413

Seaweed hugger

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #337 on:** December 12, 2021, 03:20:19 PM »

My stuff is green sometimes too. Multiple xylene recrystallizations take care of that

I did a search through the thread for azide but nothing came up, has the carbamate been attempted with an azide? Well I'm pretty sure one person has, but I can't find a write up.

Report to moderator Logged

The Germans express it nicely: "Hunger ist der beste Koch,"
which means that a hungry man at table will not complain about quality. - Max Gergel

May all the gods of furious strong be with you as you crunch opponents, and live like a windrammer as you fuck

helional1

Larvae

Posts: 1

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #338 on:** March 18, 2022, 06:52:51 PM »

few comments/ideas:

- after h2o2 part, instead of waiting overnight - add cold water, leave in a cold to crystallize, filter off and then recrystallize directly from hot water. If you find yellow oil at the bottom while most of the amide is dissolved in boiling water - either decant off or add methanol/other alcohol to dissolve it/nitrile (better/simpler is to do decantation - adding alcool into 100C boiling water is fun).
- nitrile - keeping temperature at 90C is kind of fake - as soon as reaction

mixture reach something around 80-90, reaction begin exotermic and temp rise up to around 110. So instead of "keeping temperature", just left it without external heating until energy from reaction heat itself.
- for h2o2 part - bucket with an ice is a must to avoid soyuz rocket (fuck putin, anyway). perform reaction in a big flask/bucket/whatever to avoid boil over
- add a bit of phenolphtalein into your nitrile/dmso mixture to easily monitor pH - start adding h2o2 until color becomes purple (by adding naoh - add almost everthing you prepared).

Report to moderator Logged

Quantum Dude

Dominant Wasp

Posts: 289

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #339 on:** March 19, 2022, 04:22:22 PM »

I remember experimenting with a somewhat different approach to prepare helionamide a longtime ago. I was drowning in helional and wanted a quick shortcut to the Beckmann rearrangement (even if it meant reasonable loss of yield).

You can easily form the nitrile of helional by mixing it with a slight excess of hydroxylamine*HCl in solvent-free conditions. Simply heat gently the mixture on a sand bath at 100 celsius for an hour or so (water and HCl will release). The nitrile forms as a deep red oil. After cooling to room temperature, any suitable polar solvent is added to the reaction flask to dissolve the crude nitrile. The latter extract is then introduced into a mixture of glacial acetic/sulfuric acid and heated at reflux for roughly an hour. The reaction mixture is afterwards poured into a large excess of ice cold water as the (very) crude helionamide precipitates out. It is filtered out and recrystallized in ethyl acetate.

gozum2012.pdf (106.78 kB - downloaded 107 times.)
moorthy2005.pdf (99.26 kB - downloaded 96 times.)

« Last Edit: March 19, 2022, 05:03:16 PM by Quantum Dude »

Report to moderator Logged

loft

Founding Wasp

Posts: 1,154

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #340 on:** March 21, 2022, 09:19:03 AM »

Was the recrystallized amide any good? Did you characterize it in your lazy mood or can tell how it performed in the subsequent reaction compared to "orderly" obtained amide?

Report to moderator Logged

"All things are poison, and nothing is without poison; the dosage alone makes it so a thing is not a poison." - Paracelsus

Quantum Dude

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES

Quote

Dominant Wasp

Posts: 289

INTO AMIDES results
« **Reply #341 on:** March 21, 2022, 09:30:17 AM »

Quote from: loft on March 21, 2022, 09:19:03 AM

> Was the recrystallized amide any good? Did you characterize it in your lazy mood or can tell how it performed in the subsequent reaction compared to "orderly" obtained amide?

No, I've been saving it for 10 years so I can shove it up your mother's twat.

Report to moderator Logged

Sawdust and Honey

Founding Wasp

Posts: 1,624

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote
« **Reply #342 on:** March 21, 2022, 09:34:20 AM »

Jeez guys calm down. I don't wanna split this topic.

Report to moderator Logged

End of the road. Nothing to do, no hope of things getting better.
Sounds like Saturday night at my house.

loft

Founding Wasp

Posts: 1,154

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote
« **Reply #343 on:** March 21, 2022, 09:09:41 PM »

Quote from: Quantum Dude on March 21, 2022, 09:30:17 AM

> **Quote from: loft on March 21, 2022, 09:19:03 AM**
>
> > Was the recrystallized amide any good? Did you characterize it in your lazy mood or can tell how it performed in the subsequent reaction compared to "orderly" obtained amide?
>
> No, I've been saving it for 10 years so I can shove it up your mother's twat.

Did I say anything offending? In case I did: I'm sorry, that was not my intention.

Report to moderator Logged

"All things are poison, and nothing is without poison; the dosage alone makes it so a thing is not a poison." - Paracelsus

Quantum Dude

Dominant Wasp

Posts: 289

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote
« **Reply #344 on:** March 21, 2022, 09:28:00 PM »

Quote from: loft on March 21, 2022, 09:09:41 PM

> **Quote from: Quantum Dude on March 21, 2022, 09:30:17 AM**
>
> > **Quote from: loft on March 21, 2022, 09:19:03 AM**
> >
> > > Was the recrystallized amide any good? Did you characterize it in your lazy mood or can tell how it performed in the subsequent reaction compared to "orderly"

obtained amide?

No, I've been saving it for 10 years so I can shove it up your mother's twat.

Did I say anything offending? In case I did: I'm sorry, that was not my intention.

Sorry mate, I thought you were making fun of me by calling me lazy and by asking if my recrystallized helionalamide "was actually it" or properly characterized. It was! Otherwise I would never claimed the outline I posted resulted in helionalamide. Sorry for the misunderstanding

To answer your other question, yes. MDA was actually produced by first preparing the N-chloroamide out of helionalamide and TCCA followed by Hofmann rearrangement to the desired amine.

« Last Edit: March 22, 2022, 02:28:43 AM by Quantum Dude »

Report to moderator Logged

bsmathers

Pupae

Posts: 56

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #345 on:** March 22, 2022, 05:02:59 AM »

Quote from: Quantum Dude on March 21, 2022, 09:28:00 PM

Quote from: loft on March 21, 2022, 09:09:41 PM

Quote from: Quantum Dude on March 21, 2022, 09:30:17 AM

Quote from: loft on March 21, 2022, 09:19:03 AM

Was the recrystallized amide any good? Did you characterize it in your lazy mood or can tell how it performed in the subsequent reaction compared to "orderly" obtained amide?

No, I've been saving it for 10 years so I can shove it up your mother's twat.

Did I say anything offending? In case I did: I'm sorry, that was not my intention.

Sorry mate, I thought you were making fun of me by calling me lazy and by asking if my recrystallized helionalamide "was actually it" or properly characterized. It was! Otherwise I would never claimed the outline I posted resulted in helionalamide. Sorry for the misunderstanding

To answer your other question, yes. MDA was actually produced by first preparing the N-chloroamide out of helionalamide and TCCA followed by Hofmann rearrangement to the desired amine.

What was the yield of amide in your hands? I've had terrible luck with the Soyuz rocket phenomenon with DMSO/H2O2, so relatively easy alternatives are definitely interesting.

Report to moderator Logged

Quantum Dude

Dominant Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #346 on:** March 22, 2022, 10:22:31 AM »

Quote

What was the yield of amide in your hands? I've had terrible luck with the Soyuz rocket

Posts: 289

phenomenon with DMSO/H2O2, so relatively easy alternatives are definitely interesting.

It's been a long time and all I can say is that it was definitely greater than 50% Helionamide (out of Helional as the Helionitrile was never properly isolated though I'm fairly sure its yield was nearly quantitative).

The procedure followed almost exactly the 2 references I attached in my initial post. I do remember that my first trial of Helionitrile hydrolysis produced a significant amount of polymerization and tar but a proper recrystallization took care of it. IIRC I changed the ratios of GAA:H2SO4 from 2:1 to 4:1 (maybe 5:1) and it ran much more smoothly though there was still a lot of impurities in the crude Helionamide. In retrospect, maybe refluxing the mixture was overkill and letting it run at RT, like the authors do for certain substrates,would have been better. Never really tried to optimize it frankly.

Report to moderator Logged

Mrbovinejony

Founding Wasp

Posts: 1,413

Seaweed hugger

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #347 on:** March 22, 2022, 11:07:33 AM »

Why not reduce the nitrile to the amine? I've had good luck reducing acetonitrile to ethylamine with both cocl2 and cucl2 and nabh4. Seems like it'd work much better than the shitty Hoffman

Report to moderator Logged

The Germans express it nicely: "Hunger ist der beste Koch,"
which means that a hungry man at table will not complain about quality. - Max Gergel

May all the gods of furious strong be with you as you crunch opponents, and live like a windrammer as you fuck

Quantum Dude

Dominant Wasp

Posts: 289

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #348 on:** March 22, 2022, 11:16:53 AM »

Quote from: Mrbovinejony on March 22, 2022, 11:07:33 AM

> Why not reduce the nitrile to the amine? I've had good luck reducing acetonitrile to ethylamine with both cocl2 and cucl2 and nabh4. Seems like it'd work much better than the shitty Hoffman

Because the final compound wouldn't be MDA as the Hofmann rearrangement involves the formation/hydrolysis of an isocyanate followed by release of CO2 (i.e product has one less carbon than substrate).

« *Last Edit: March 22, 2022, 07:48:34 PM by Quantum Dude* »

Report to moderator Logged

BrominePirate

Pupae

Posts: 54

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #349 on:** March 25, 2022, 02:56:30 PM »

Ive had such a shitty time trying the one pot method. To be fair, I am a terrible chemist, so it makes sense, even if other people find it easy. But I've done the

stoich for making the nitrile, i just need a new hotplate and ill get to work on going to the nitrile and then to the amide using the GAA/H2SO4. Ill let you guys know what happens, though I'm sure it seems pointless compared to other methods that need research

Report to moderator Logged

Quantum Dude

Dominant Wasp

Posts: 289

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #350 on:** March 25, 2022, 03:03:17 PM »

> **Quote from: BrominePirate on March 25, 2022, 02:56:30 PM**
>
> Ive had such a shitty time trying the one pot method. To be fair, I am a terrible chemist, so it makes sense, even if other people find it easy. But I've done the stoich for making the nitrile, i just need a new hotplate and ill get to work on going to the nitrile and then to the amide using the GAA/H2SO4. Ill let you guys know what happens, though I'm sure it seems pointless compared to other methods that need research

Let me know if you need my input. Sharing your results, regardless of success or failure, is never pointless.

« *Last Edit: March 26, 2022, 12:39:06 AM by Quantum Dude* »

Report to moderator Logged

loft

Founding Wasp

Posts: 1,154

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #351 on:** March 27, 2022, 04:15:49 PM »

> **Quote from: Quantum Dude on March 21, 2022, 09:28:00 PM**
>
> Sorry mate, I thought you were making fun of me by calling me lazy and by asking if my recrystallized helionalamide "was actually it" or properly characterized. It was! Otherwise I would never claimed the outline I posted resulted in helionalamide. Sorry for the misunderstanding

No I wasn't, I'm just not very eloquent in English. You talked about taking a shortcut which I translated to "lazy" with no harm or fun-making in mind. I wanted to know if a simple recrystallization was sufficient to purify the described "very crude" product. And I'm glad to hear it was

Report to moderator Logged

"All things are poison, and nothing is without poison; the dosage alone makes it so a thing is not a poison." - Paracelsus

sparklebags

Dominant Wasp

Posts: 457

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #352 on:** March 28, 2022, 01:51:38 AM »

Hmmmm, interesting. I have been getting close to 80% with the more common method but that also takes way more time. I think I'll give this a try next time!

Report to moderator Logged

sparklebags

Re: FACILE ONE-POT CONVERSION

Quote

Dominant Wasp

Posts: 457

OF ALDEHYDES INTO AMIDES results

« **Reply #353 on:** April 01, 2022, 03:15:03 AM »

Quote from: Quantum Dude on March 22, 2022, 10:22:31 AM

Quote

> What was the yield of amide in your hands? I've had terrible luck with the Soyuz rocket phenomenon with DMSO/H2O2, so relatively easy alternatives are definitely interesting.

It's been a long time and all I can say is that it was definitely greater than 50% Helionamide (out of Helional as the Helionitrile was never properly isolated though I'm fairly sure its yield was nearly quantitative).

The procedure followed almost exactly the 2 references I attached in my initial post. I do remember that my first trial of Helionitrile hydrolysis produced a significant amount of polymerization and tar but a proper recrystallization took care of it. IIRC I changed the ratios of GAA:H2SO4 from 2:1 to 4:1 (maybe 5:1) and it ran much more smoothly though there was still a lot of impurities in the crude Helionamide. In retrospect, maybe refluxing the mixture was overkill and letting it run at RT, like the authors do for certain substrates,would have been better. Never really tried to optimize it frankly.

Did you have to actually heat it to 100* or was it able to run on its own exothermia with a mild heating? I ran it with a hot plate and it ran away pretty quickly, I will try again with minimal heat and see how it goes.

Report to moderator Logged

Quantum Dude

Dominant Wasp

Posts: 289

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #354 on:** April 01, 2022, 03:22:04 AM »

Quote from: sparklebags on April 01, 2022, 03:15:03 AM

Quote from: Quantum Dude on March 22, 2022, 10:22:31 AM

Quote

> What was the yield of amide in your hands? I've had terrible luck with the Soyuz rocket phenomenon with DMSO/H2O2, so relatively easy alternatives are definitely interesting.

It's been a long time and all I can say is that it was definitely greater than 50% Helionamide (out of Helional as the Helionitrile was never properly isolated though I'm fairly sure its yield was nearly quantitative).

The procedure followed almost exactly the 2 references I attached in my initial post. I do remember that my first trial of Helionitrile hydrolysis produced a significant amount of polymerization and tar but a proper recrystallization took care of it. IIRC I changed the ratios of GAA:H2SO4 from 2:1 to 4:1 (maybe 5:1) and it ran much more smoothly though there was still a lot of impurities in the crude Helionamide. In retrospect, maybe refluxing the mixture was overkill and letting it run at RT, like the authors do for certain substrates,would have been better. Never really tried to optimize it frankly.

Did you have to actually heat it to 100* or was it able to run on its own exothermia with a mild heating? I ran it with a hot plate and it ran away pretty quickly, I will try again with minimal heat and see how it goes.

As I said, heating was gentle and a sand bath at 100 ^{0}C was used (though an oil bath would work equally fine I'm sure). Heating must be homogeneous, no direct contact on hot plate. IIRC scale was maybe 30-50 mL helional using a 500 mL rbf.

Report to moderator Logged

sparklebags
Dominant Wasp
Posts: 457

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #355 on:** April 01, 2022, 03:53:22 AM »

Quote

Ah yes, as usual, I was doing 20 things at once. A heating mantle would provide similar heating correct? I do have a sand bath set up, but at a very small scale. I'll give another go

Report to moderator Logged

Quantum Dude
Dominant Wasp

Posts: 289

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #356 on:** April 01, 2022, 03:58:13 AM »

Quote

> **Quote from: sparklebags on April 01, 2022, 03:53:22 AM**
>
> Ah yes, as usual, I was doing 20 things at once. A heating mantle would provide similar heating correct? I do have a sand bath set up, but at a very small scale. I'll give another go

Yes a heating mantle would be fine. The reaction is really easy to monitor too. All the NH2OH*HCl dissolves fast with a little heating and water/HCl vapor are released. Oil turns orange/red. Temperature control is not that important, make sure it's gentle and uniform though.

Report to moderator Logged

sparklebags
Dominant Wasp
Posts: 457

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #357 on:** April 01, 2022, 04:33:46 AM »

Quote

Yeah, I did 1 mole aldehyde to 1.1 moles of NH2OH*HCL....I'll set the heat a good bit lower and get a feel for it. DMSO has become very expensive and scarce.

Report to moderator Logged

aes256
Founding Wasp

Posts: 841

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #358 on:** April 05, 2022, 03:22:16 AM »

Quote

@Quantum Dude, at which point (and how) was the reaction considered complete?

Thanks for a refreshing take on this well-beaten out reaction solventless conditions - very interesting.

as underground chemists we've been very blessed with access to this starting material for so long now, those who exploited its availability surely had fun playing around with different routes and reaction parameters.

Report to moderator Logged

Quote from: Eleusis

> However, I had serious misgivings about sharing because my quest was one for knowledge and experience while, I knew, for most others it would be for purely economic reasons.

Quote

> He hardly ever spoke of magic, and when he did it was like a history lesson and no one could bear to listen to him.

Quote from: Orange

> you can always dont make things.
> but u cant always make things happen.

Quantum Dude

Dominant Wasp

Posts: 289

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #359 on:** April 05, 2022, 09:19:28 AM »

Quote from: aes256 on April 05, 2022, 03:22:16 AM

> @Quantum Dude, at which point (and how) was the reaction considered complete?
>
> Thanks for a refreshing take on this well-beaten out reaction solventless conditions - very interesting.
>
> as underground chemists we've been very blessed with access to this starting material for so long now, those who exploited its availability surely had fun playing around with different routes and reaction parameters.

Well the synthetic scheme I used is not really a "one-potter" per se as the one discussed in this thread but I thought it could be helpful to post about it regardless Both are essentially equivalent though as they first involve formation of Helionitrile followed by partial hydrolysis to obtain Helionamide.

Which reaction are you referring to?

Report to moderator Logged

Orange

Founding Wasp

Posts: 594

I've got a fuckload of vitamine c in me, watchout!

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #360 on:** April 05, 2022, 05:56:46 PM »

Quote from: Quantum Dude on March 21, 2022, 09:28:00 PM

> **Quote from: loft on March 21, 2022, 09:09:41 PM**
>
> > **Quote from: Quantum Dude on March 21, 2022, 09:30:17 AM**
> >
> > > **Quote from: loft on March 21, 2022, 09:19:03 AM**
> > >
> > > Was the recrystallized amide any good? Did you characterize it in your lazy mood or can tell how it performed in the subsequent reaction compared to

"orderly" obtained amide?

> No, I've been saving it for 10 years so I can shove it up your mother's twat.

> Did I say anything offending? In case I did: I'm sorry, that was not my intention.

> Sorry mate, I thought you were making fun of me by calling me lazy and by asking if my recrystallized helionalamide "was actually it" or properly characterized. It was! Otherwise I would never claimed the outline I posted resulted in helionalamide. Sorry for the misunderstanding
>
> To answer your other question, yes. MDA was actually produced by first preparing the N-chloroamide out of helionalamide and TCCA followed by Hofmann rearrangement to the desired amine.

hey, do you have experimental details of this? Just TCCA in aques media or did u used alcohol/TCCA then add into NaOH

Report to moderator Logged

When things are good, drugs make them great.
When things are bad, they become fucking awful.
This is when to stop, but in reality, getting off that bus usually takes some time.

/CJ

"You never find it until you give up. Then it jumps out at you."

- Atara

aes256
Founding Wasp

Posts: 841

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #361 on:** April 05, 2022, 10:32:54 PM
»

@Quantum Dude: oh sorry, I had the solventless reaction in mind.

Report to moderator Logged

> **Quote from: Eleusis**
>
> However, I had serious misgivings about sharing because my quest was one for knowledge and experience while, I knew, for most others it would be for purely economic reasons.

> **Quote**
>
> He hardly ever spoke of magic, and when he did it was like a history lesson and no one could bear to listen to him.

> **Quote from: Orange**
>
> you can always dont make things.
> but u cant always make things happen.

isoprene
Pupae

Posts: 52

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #362 on:** May 18, 2022, 07:51:03 PM
»

this piqued my interest.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6257113/
Could this reaction be applicable to this substrate?

Report to moderator Logged

BrominePirate
Pupae
Posts: 54

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote
« **Reply #363 on:** May 20, 2022, 04:53:45 PM »

that paper is almost certainly not applicable to the substrate, or atleast it would probably need some major tweaking. helional is an aliphatic aldehyde, not an aromatic aldehyde like the substrate used in the paper.

Report to moderator Logged

superlative
Subordinate Wasp

Posts: 140

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote
« **Reply #364 on:** May 30, 2022, 08:34:11 AM »

Will 50% H2O2 be too concentrated, and ruin the reaction? Just had the worst yield ever.

Report to moderator Logged

sparklebags
Dominant Wasp
Posts: 457

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote
« **Reply #365 on:** May 30, 2022, 11:09:42 PM »

I’ve found higher concentrations require additional H2O

Report to moderator Logged

aes256
Founding Wasp

Posts: 841

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote
« **Reply #366 on:** June 13, 2022, 01:50:32 PM »

> **Quote from: sparklebags on May 30, 2022, 11:09:42 PM**
> I’ve found higher concentrations require additional H2O

how come? to dissolve the MSM that is created?

Report to moderator Logged

> **Quote from: Eleusis**
> However, I had serious misgivings about sharing because my quest was one for knowledge and experience while, I knew, for most others it would be for purely economic reasons.

> **Quote**
> He hardly ever spoke of magic, and when he did it was like a history lesson and no one could bear to listen to him.

Quote from: Orange

> you can always dont make things.
> but u cant always make things happen.

Loki
Dominant Wasp
Posts: 407

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #367 on:** September 03, 2022, 03:55:37 PM »

Can hydroxylamine sulfate be substituted for the hydrochloride? It sounds like DMSO just needs to be protonated, is that right?

Report to moderator Logged

Incestandmeth
Larvae
Posts: 9

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #368 on:** September 05, 2022, 05:55:22 PM »

Quote from: superlative on May 30, 2022, 08:34:11 AM

> Will 50% H2O2 be too concentrated, and ruin the reaction? Just had the worst yield ever.

Yes, the acid will destroy the methylene-dioxy bridge on your helional. Any lead compounds that have methylene-dioxy bridges on them are sensitive to concentrated acids particularly sulphuric acid.

Report to moderator Logged

Incestandmeth
Larvae
Posts: 9

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #369 on:** September 05, 2022, 05:58:09 PM »

Quote from: Loki on September 03, 2022, 03:55:37 PM

> Can hydroxylamine sulfate be substituted for the hydrochloride? It sounds like DMSO just needs to be protonated, is that right?

Yes but you will need to use more hydroxylamine sulfate than HCl because of the larger molar mass of the sulphate ion. So make sure you use the same molar ratio, by adjusting the mass using the molar mass of the sulphate.

Report to moderator Logged

Incestandmeth
Larvae
Posts: 9

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #370 on:** September 05, 2022, 06:01:20 PM »

Quote from: loft on March 21, 2022, 09:19:03 AM

> Was the recrystallized amide any good? Did you characterize it in your lazy mood or can tell how it performed in the subsequent reaction compared to "orderly" obtained amide?

Purity of the amide does not significantly alter the yield of the Hoffman rearrangement anyway. Particularly if you use a carbamate intermediate such as methyl carbamate from methanol or isopropyl from IPA.

Report to moderator Logged

superlative
Subordinate Wasp

Posts: 140

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #371 on:** January 22, 2023, 03:22:28 PM »

"Under the usual conditions(e.g methanol, reflux, 6h) aromatic nitriles give amides in good yield (80-90%(, but in the...."

What are these "usual conditions"?

Anybody have a ref to Radziszewski's base-catalyzed hydration of nitriles? Radziszewski, B. Ber. Dtsch. Chem. Ges1885, 18, 355.

The variation of this method in this paper is very different from the Scarecrow approach as it is running cold in stead of hot, but also run in DMSO instead of MeOH.

i did 2 runs last night, and they both failed for some reason. i thought i had this nailed down blindfolded The more i study Chemistry, the worse i get at it.

Efficient Conversion of Nitriles to Amides with Basic Hydrogen Peroxide in Dimethyl Sulfoxide.pdf (214.36 kB - downloaded 30 times.)

Report to moderator Logged

java
Founding Wasp

Posts: 1,484

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #372 on:** January 24, 2023, 03:29:37 AM »

.....Anybody have a ref to Radziszewski's base-catalyzed hydration of nitriles? Radziszewski, B. Ber. Dtsch. Chem. Ges1885, 18, 355.

https://sci-hub.se/10.1002/cber.18850180171

...translation,

65. Br. Radeiaseweki: About the oxidation means at Waa-
aeratof&uperosyd.
[Second notification;ng.l
(Received February 9; communicated in session by Hm.A. Pinner.)
T h e b e h a t i o n o f o f n i t r i l e s o f h e a d o r o f s o f s u p e r o x y d .
It follows from the investigations I have carried out that the
Nitriles are converted into amides with hydrogen peroxide with development
development of molecular oxygenates, according to the equation: R .C N
+ 2Ha 02 = R . C ONH2 + 0s + HSO. The effect occurs
particularly easy in alkaline reaction, and at a temperature of
about 40° C. The reaction is particularly evident when
one applies dam such nitriles whose amides are difficult in water
are soluble, e.g. B. the aromatic nitriles, capronamide, cyano a. 8. w.

If you z. B. to hydrogen peroxide benzonitrile and somea potash
adds huge, so goes at the incubation temp also after some
minutes while vigorously shaking the whole quantity of the nitriles in
pure crystallized benzamide is obtained. The reaction proceeds
quantitatively. The behavior of the cyan is particularly interesting. At the
Dissolve in a 3% solution of hydrogen peroxide
356
this gas goes d o n after a few minutes, and after adding
of a drop of caustic potash eoequivalently and completely in oxamide,
which develops in echneous, sometimes up to 6 mm long needles
separates, with molecular oxygen escaping at the same time. the
The reaction proceeds quantitatively - no by-products are formed at all
- and can serve as a lecture attempt. The hydrocyanic acid
there is also oxamide, as A t field had already observed, but
according to my investigations, by-products are also formed.
You don't have to wait whole months to get the
to confirm the formation of the oxamide, but in any case it is time for that
of a few hours required. But since formamide with water
substance peroxide does not supply oxamide, I am of the opinion that at
the reaction first converts part of the hydrogen cyanide to cyanide
is led: 2HCN+H202=2HzO+(CN)2, and only that
cyanide formed is converted into oxamide.
My investigations into the action of hydrogen super-
oxide on sulfur compounds, rhodanide and mustard oil and so far
advanced that I will soon be able to report on it.
L emb e rg in Gal izi e n, Universitiitslaboratorium.

« *Last Edit: January 24, 2023, 03:35:25 AM by java* » Report to moderator Logged

"If you like yourself....then take care of yourself"

kamikaze3030
Larvae
Posts: 1

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #373 on:** June 05, 2023, 04:21:23 AM »

Quote from: Scarecrow on February 18, 2017, 06:51:50 PM

100g
Helional (100g ~92ml)
Hydroxylamine HCl (36.93g)
DMSO (500ml)
NaOH (21g)
H2O2 30% soln (ph 7.5-7.😎 (600ml)

Helional mass: 192.21g/mol
Hydroxylamine.HCl mass: 69.49g/mol

Aldehyde (.52mol, 100g) was added to a solution of Hydroxylamine HCl (.53mol, 36.93g) in DMSO (500ml). This solution was then heated for 90 minutes at 85-90* over hot/boiling water with vigorous stirring [make sure RBF is open top]. Upon removal of heat, the solution was allowed to stand on a stirrer until the temp reached ~80*, and aqueous NaOH added** until a pH of 10 was reached (addition of NaOH solution causes smoke, and darkening of solution. Sharp change in pH noted). [optional: 6g of bicarb soda was added to aid as a pH buffer]. Then at 70*+, 500-600ml of neutralized 30% H2O2 was added dropwise through an addition funnel, maintaining the temperature under 95*, and monitoring the pH to keep it between 9-10 (add 10% NaOH solution if required) . Upon completion of the addition, the reaction was allowed to stir until gas evolution and exothermia had ceased. The resulting light yellow solution is poured into a pyrex dish at around 50*, and put in a 0* fridge and allowed to sit overnight. The resulting crystals vacuum filtered and washed with water. Yield quantitative. (Should have sparkling white amide crystals maybe with hints of yellow which

should come off in a water wash).

Reasons for low yields can be overheating your Hydroxylamine/DMSO (anything over 100* will begin to cause yellow impure amide/lower yields), and not adding enough H2O2 in the correct pH range.

**Aqueous NaOH suggested: stoich NaOH in 200ml water. I.e 20.8g of NaOH in 200ml water. (11% solution), I usually make a bit extra in case the pH falls out of range.

Notes
- I recommend pre-dissolving hydroxylamine in a beaker in about 400ml DMSO then adding to RBF, adding aldehyde then rinsing with remaining 100ml of DMSO
- I run the reaction in a 3 neck RBF which during the H2O2 addition I allow to stand on a stirrer, maintaining temp on its own exothermia, keeping the temp under 95* but optimally around 70-85. You may want to keep an ice bath separately to cool it. There will be moderate exothermia and your pH will decrease slowly if you do not basify your H2O2 before addition, so I highly recommend basifying your H2O2 before addition. If you don't basify your H2O2 before addition, you will find that as you add H2O2 the reaction, the pH will decrease out of reaction range and your reaction will die. You can continually add NaOH to bring your reaction back into pH range if you add non basified H2O2, but if you add too much NaOH you may cause rapid base catalyzed H2O2 decomposition and ruin your reaction (and your ceiling).
- Alternatively if you dont want to wait overnight to get pure amide thats recrystalized out of the DMSO, you can dunk your post reaction in cold water and vacuum filter immediately. Doesn't give as nice crystals though.

Stay safe!

Does anyone have the final part of this synthesis in the same quantities as the product used? The part where the hofmann rearrangement is done using tcca to form the mda. Thank you very much

Report to moderator Logged

aes256
Founding Wasp

Posts: 841

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #374 on:** June 06, 2023, 07:32:38 AM
»

learn molar calculations. nobody is gonna spoon feed you. nice first post.. -_-

Report to moderator Logged

Quote from: Eleusis

> However, I had serious misgivings about sharing because my quest was one for knowledge and experience while, I knew, for most others it would be for purely economic reasons.

Quote

> He hardly ever spoke of magic, and when he did it was like a history lesson and no one could bear to listen to him.

Quote from: Orange

> you can always dont make things.
> but u cant always make things happen.

Lab_Rat
Subordinate Wasp

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #375 on:** June 07, 2023, 05:59:18 AM
»

Posts: 209

Something I've been looking into because I don't like the smell (nor the cost) of DMSO. Also turns nitriles to the amide.

DES Amides from aldehydes.pdf (277.21 kB - downloaded 51 times.)

Report to moderator Logged

aes256

Founding Wasp

Posts: 841

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #376 on:** June 07, 2023, 11:43:18 PM »

How are you going to handle/dispose all that solvent containing zinc chloride?

Quote

> General process for the synthesis of amides from aldehydes:
> **Aldehyde 0.106 g (1 mmol)**, hydroxyl amine hydrochloride 0.069 g (1 mmol) and choline chloride: 2 zinc chloride based **DES (4 g)**

Report to moderator Logged

Quote from: Eleusis

> However, I had serious misgivings about sharing because my quest was one for knowledge and experience while, I knew, for most others it would be for purely economic reasons.

Quote

> He hardly ever spoke of magic, and when he did it was like a history lesson and no one could bear to listen to him.

Quote from: Orange

> you can always dont make things.
> but u cant always make things happen.

Orange

Founding Wasp

Posts: 594

I've got a fuckload of vitamine c in me, watchout!

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #377 on:** June 08, 2023, 12:11:54 AM »

why dispose, add water extract and boil it down again, voila new DES

Report to moderator Logged

When things are good, drugs make them great.
When things are bad, they become fucking awful.
This is when to stop, but in reality, getting off that bus usually takes some time.

/CJ

"You never find it until you give up. Then it jumps out at you."

- Atara

Lab_Rat

Re: FACILE ONE-POT CONVERSION

Quote

Subordinate Wasp

Posts: 209

OF ALDEHYDES INTO AMIDES results

« **Reply #378 on:** June 08, 2023, 03:48:30 AM »

DES are pretty recyclable, also per science madness wiki ZnCl2 can easily be neutralized with a CaOH sol.

Report to moderator Logged

AKADrHead

AKA Dr. Head
Subordinate Wasp

Posts: 111

The road of excess leads to the palace of wisdom.

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #379 on:** November 01, 2023, 08:46:45 PM »

i'm trying this but cannot upload pics. get:

An Error Has Occurred!
Your attachment couldn't be saved. This might happen because it took too long to upload or the file is bigger than the server will allow.

Please consult your server administrator for more information.

« *Last Edit: November 01, 2023, 08:49:25 PM by AKADrHead* »

Report to moderator Logged

Let your plans be dark, impenetrable, and when you move, fall like a thunderbolt.

Sawdust and Honey

Founding Wasp

Posts: 1,624

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #380 on:** November 01, 2023, 09:02:59 PM »

Try to resize them to standard (for example 1000x1500) and to reduce the size to like 1mb.

Report to moderator Logged

End of the road. Nothing to do, no hope of things getting better.
Sounds like Saturday night at my house.

Lab_Rat

Subordinate Wasp

Posts: 209

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #381 on:** November 02, 2023, 04:50:02 AM »

when uploading the photos try choosing a size that fits the mb range

Report to moderator Logged

jacq

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES

Quote

Larvae

Posts: 19

INTO AMIDES results
« **Reply #382 on:** January 06, 2024, 09:25:45 AM »

Apologies for english
What is smallest DMSO that can be using for 100g aldehyde? My interest is in nitrile only. I can tell you 150ml is not enough if not watched!! The smell in in my nose for a month!

DMSO is expensive and I do not like it, but it is very efficient for nitrile. Afterwards add water and collect easy. Do you think 250ml DMSO is enough? Or 500ml per 100g is only way?

Do you think this alternative is working perhaps?

-107g oxime (~0.51M) into 150ml DMSO on water bath at 75C.
-Drip in SLOWLY 52ml 32% HCl (~0.51M) and let react for long time so exothermia is delayed.

Residue HCl from Hydroxylamine, make DMSO work yes? So adding it perhaps also activate? Perhaps HCl in alcohols? Oxime is so easy! Perhaps is prevent rockets?

Report to moderator Logged

Osmiridium

Subordinate Wasp

Posts: 125

100% Autistic Hyperfocus, 0% Academia

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #383 on:** January 06, 2024, 10:37:14 PM »

Quote

One would not recommend using an alcohol as a co-solvent. It'll drop the boiling point of the solvent mixture and you'll likely get a rocket at even lower temperatures.

DMF could be used as a co-solvent along with DMSO but it's similarly expensive.

The HCl activates the DMSO, not the oxime, so don't try doing this reaction with alcoholic HCl.

Report to moderator Logged

What Would Strike Do?

IA_Wales

Larvae

Posts: 11

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results
« **Reply #384 on:** June 01, 2024, 06:43:06 PM »

Quote

I may have missed it but how are bees measuring pH? I saw a reply citing "a pH measuring device"... Assuming this is a pH meter, how is this meter calibrated? I'm considering taking aliquots of reaction mixture and adding to water this is leading to inconsistent measurements when using universal indicator strips. I have access to a pH meter just dont want to damage it if not necessary. Any advice appreciated!

Report to moderator Logged

Osmiridium

Re: FACILE ONE-POT CONVERSION

Quote

Subordinate Wasp

Posts: 125

100% Autistic Hyperfocus, 0% Academia

OF ALDEHYDES INTO AMIDES results

« **Reply #385 on:** June 01, 2024, 10:59:22 PM »

pH meters are calibrated with buffer solutions, three different solutions with different pH values in One's experience.

Please put any future off-topic questions in this thread: https://www.thevespiary.org/talk/index.php?topic=4446.980

Alternatively for questions that simple you might want to ask over on SM. They have a lot more users who aren't as niche specialised as we are, so you're likely to get faster and higher quality answers about general topics.

Report to moderator Logged

What Would Strike Do?

IA_Wales

Larvae

Posts: 11

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #386 on:** June 05, 2024, 04:22:17 AM »

Quote from: Osmiridium on June 01, 2024, 10:59:22 PM

> pH meters are calibrated with buffer solutions, three different solutions with different pH values in One's experience.
>
> Please put any future off-topic questions in this thread: https://www.thevespiary.org/talk/index.php?topic=4446.980
>
> Alternatively for questions that simple you might want to ask over on SM. They have a lot more users who aren't as niche specialised as we are, so you're likely to get faster and higher quality answers about general topics.

Thank you, I'm familiar with pH meter calibration but thought that only extends to aqueous solutions (as the two/three-point calibration are typically aqueous buffer solutions). With the majority of the mixture being DMSO at the point of NaOH addition, is the pH measured by taking an aliquot of mixture and adding it to a buffered aqueous solution. Hoping someone who has attempted this prep (with pH monitoring) can chime in on the best way to do this. Thanks again!

Report to moderator Logged

sparklebags

Dominant Wasp

Posts: 457

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #387 on:** June 05, 2024, 05:49:40 PM »

I think you are over thinking it. Just figure out how much H2O2 you can add in one go without it becoming to exothermic. Take that amount and figure out how much NaOH it takes to get the PH to around 8 - its pretty hard to get the H2O2 much higher without it itself becoming to exothermic. Even getting it to Ph8, eventually it will start to heat up and become too much to handle. I would get my reaction ph up to 11, adding NaOH as needed eventually it will stay around 10 or 11. Ph paper works just fine. Anywhere between 9 and 12 is great, I do feel like I finally deduced that ph10 was the sweet spot. So to recap, start the reaction, adjust ph to 11,12 whatever - very high. Adjust you

H2O2 to ph8, add NaOH to reaction as needed to keep it between 9 and 11.

Report to moderator Logged

Snoopy
Larvae
Posts: 24

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote
« **Reply #388 on:** June 06, 2024, 09:01:58 PM »

jacq,
You can make the nitrile in anhydrous conditions, no DMSO needed.
Quantum dude made a post about it earlier in this thread, look it up, it has some additional info.

You can easily form the nitrile of helional by mixing it with a slight excess of hydroxylamine*HCl in solvent-free conditions. Simply heat gently the mixture on a sand bath at 100 celsius for an hour or so (water and HCl will release). The nitrile forms as a deep red oil.

I add the referenced paper

gozum2012.pdf (106.78 kB - downloaded 15 times.)

Report to moderator Logged

Osmiridium
Subordinate Wasp

Posts: 125
100% Autistic Hyperfocus, 0% Academia

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote
« **Reply #389 on:** June 07, 2024, 02:10:25 AM »

One has extensively done the nitrile conversion in solvent free and yes it works but it also really sucks. One recommends you follow the DMSO method. The nitrile is incredibly sticky, smells terrible, the fumes make your upper lip feel like it's burning, and it's basically only converted to the amide well in the DMSO route.

One had very mild success using a microwave method with perborate to create a tiny amount of amide. This reaction scaled even worse than the one pot.

Report to moderator Logged

What Would Strike Do?

sparklebags
Dominant Wasp
Posts: 457

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote
« **Reply #390 on:** June 07, 2024, 02:36:53 PM »

The window between fun nitrile formation and toxic vapor burning mess is really small and goes from one to the other in the blink of an eye. DMSO is so easy.

Report to moderator Logged

Snoopy
Larvae

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote
« **Reply #391 on:** June 07, 2024, 07:52:06 PM

Posts: 24

»

So the solvent free method for forming the nitrile and the following amide conversion using GAA/H2SO4 is no good?
I know the heating in the first stage needs to be gentle and care should be taken in this step but otherwise i was under the impression that this method works quite well.
The nitrile is only a step in this procedure (if you dont want the nitrile for something else) so it wont stay nitrile for long as hydrolysis to the amide follows directly.
I thought the skipping of the DMSO made it more easy not to get a runaway situation.

I dont say the DMSO method is bad, it´s probably the best way but its always good to have alternatives.

Report to moderator Logged

sparklebags

Dominant Wasp

Posts: 457

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote

« **Reply #392 on:** June 08, 2024, 04:01:59 PM »

DMSO is very easy. I eventually modified the procedure - I would add DMSO and all the aldehyde, bring up the heat to say 50* (I can't recall exactly) maybe even a bit higher. Then I would control the heat by addition of hydroxyl amine. Very easy.

Report to moderator Logged

Snoopy

Larvae

Posts: 24

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote

« **Reply #393 on:** June 11, 2024, 10:08:21 AM »

That sounds very nice.
DMSO is so commonly available so there isnt really a reason not to use it.
And it´s not very expensive either.

Report to moderator Logged

elratonjuanca

Larvae

Posts: 34

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote

« **Reply #394 on:** August 20, 2024, 11:12:47 PM »

I am to attempt the reaction at 10 gr scale.
Can I re-x the amide out of DMSO like on 100 gr scale or I must to extract it with DCM?

Report to moderator Logged

Pepito Pistol

Larvae

Posts: 2

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results Quote

« **Reply #395 on: Today** at 04:46:21 PM »

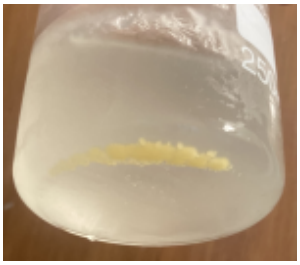
Hi!
Attempts at the one-pot Helional to helionamide process, without successful results.
Issues seem to be the same you encountered, so if you can give some hindsight it'd be greatly appreciated:
- 13,5g hidroxilamina are added to 175ml DMSO, heating and stirring until it's dissolved (40°C).
- 35g Helional are added, temperature set to 70°C in a water bath (600ml beake covered with plastic wrapping film, automatic temperature control mag-stirring hotplat with the temperature probe in the reaction mixture),then rising it up to 90°C (less than 95°C)and keeping for 90 minutes.
- Let cool to 70°C.
- A soln. made of 7,8g NaOH + 58ml water is added to the beaker, then 2g NaHCO3 suspended in 10ml water. Stuff gets darker and opaque pH is around 9-10 (pH test strips). One run some additional NaOH soln. is added to get to a pH=10 (pH testing strips).
- A soln. made of 125ml 30% H2O2 + 85ml water, freshly prepared and basified to pH= 7,0-8,0 (pH test strips is added with a pipette in 5ml portions every 30 seconds approximately, allowing foaming to stop between additions. Beaker still in water bath, temperature set to 85°C (keeping higher than 80°C but never going up to 90°C). Some exit Hermila and foaming is observed. Some NaOH soln. is required to correct pH up to 10 regularly. When peroxide soln. and NaOH soln. contacts the rxn mixture there seems to be some milky withe stuff forming, and then dissolving, or might be gas developing (volumes are not big enough for foaming). Less than half way through the addition rxn mixture starts getting lighter computed (amber) and less opaque (wouldn't call it transparent, but there's vigorous stirring ad micro bubbles though).
- After uncovering and letting everything cool down to 50°C there is an oily layer at the bottom of the beaker (clear, amber), a lighter amber aqueous layer(slightly turbid), and a very thin oily stains at the top.

Extraction with DCM, and evap gives an oily slightly reddish amber stuff. Attempt to crash in cold water (double or 10 times the sample volume, no difference) gives a milky result, which gives some opaque yellow-whiteish viscous oily like stuff at the bottom when chilled in the freezer.

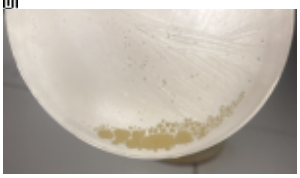
Currently loosing it, don't fully understand the difference between what I've seen in the forum from other bees…
Any help will bee very appreciated

IMG_3275.jpeg (677.2 kB, 2000x2560 - viewed 1 times.)

IMG_3278.jpeg (769.1 kB, 2271x2820 - viewed 0 times.)



IMG_3276.jpeg (523.44 kB, 2159x1896 - viewed 0 times.)



IMG_3277.jpeg (525.52 kB, 2991x1694 - viewed 1 times.)

Report to moderator Logged

Sawdust and Honey

Founding Wasp

Posts: 1,624

Re: FACILE ONE-POT CONVERSION OF ALDEHYDES INTO AMIDES results

Quote

« **Reply #396 on: Today** at 07:35:26 PM »

For future - rescale the images to 1000x1500 px for easy viewing.
My suggestion is to check the reaction by TLC, otherwise you're sort of going by feel. Are you sure of your helional? All the steps you described seem correct. Have you noticed a significant exotherm when adding peroxide? Have you tried heating the water to boiling point in order to dissolve the oil and then slowly cooling it down to crystallize?

I'm not sure about the DCM solubility of the amide. Amides tend to be weakly soluble, even in organic solvents. Hence it's better to just filter the post reaction mixture completely after letting it sit overnight in the refrigerator. It may be possible that some of your product remained in the DMSO/water layer. But I may be wrong and the amide can be very easily soluble. I haven't ever extracted it using DCM.

« *Last Edit:* ***Today*** *at 07:38:44 PM by Sawdust and Honey* » Report to moderator Logged

End of the road. Nothing to do, no hope of things getting better.
Sounds like Saturday night at my house.

Powered by SMF 2.0.19 | SMF © 2006-2009, Simple Machines LLC

XHTML RSS WAP2